

western industry



Technician assembles delicate parts under ultra-clean conditions. See page 25.

1961



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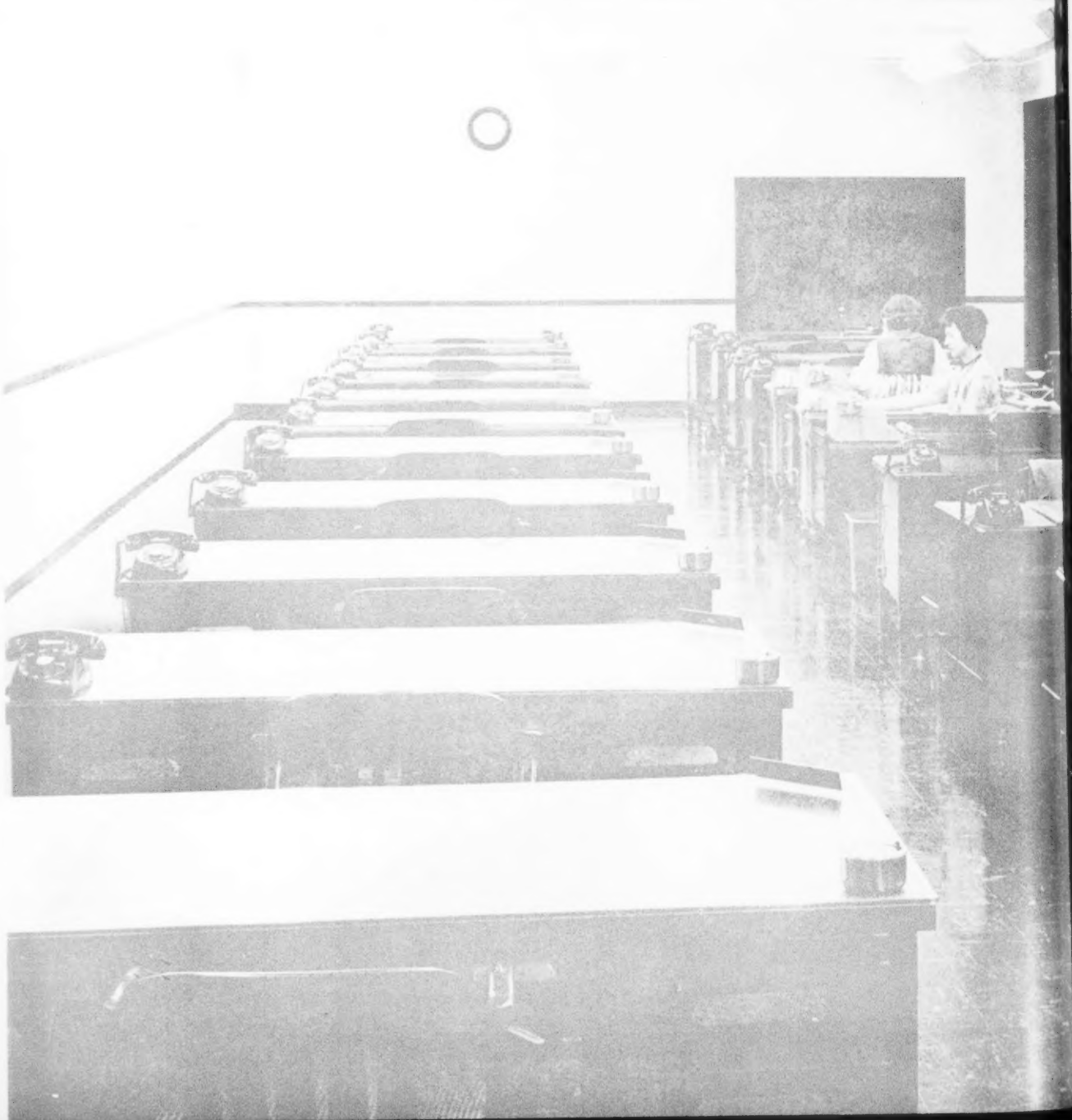
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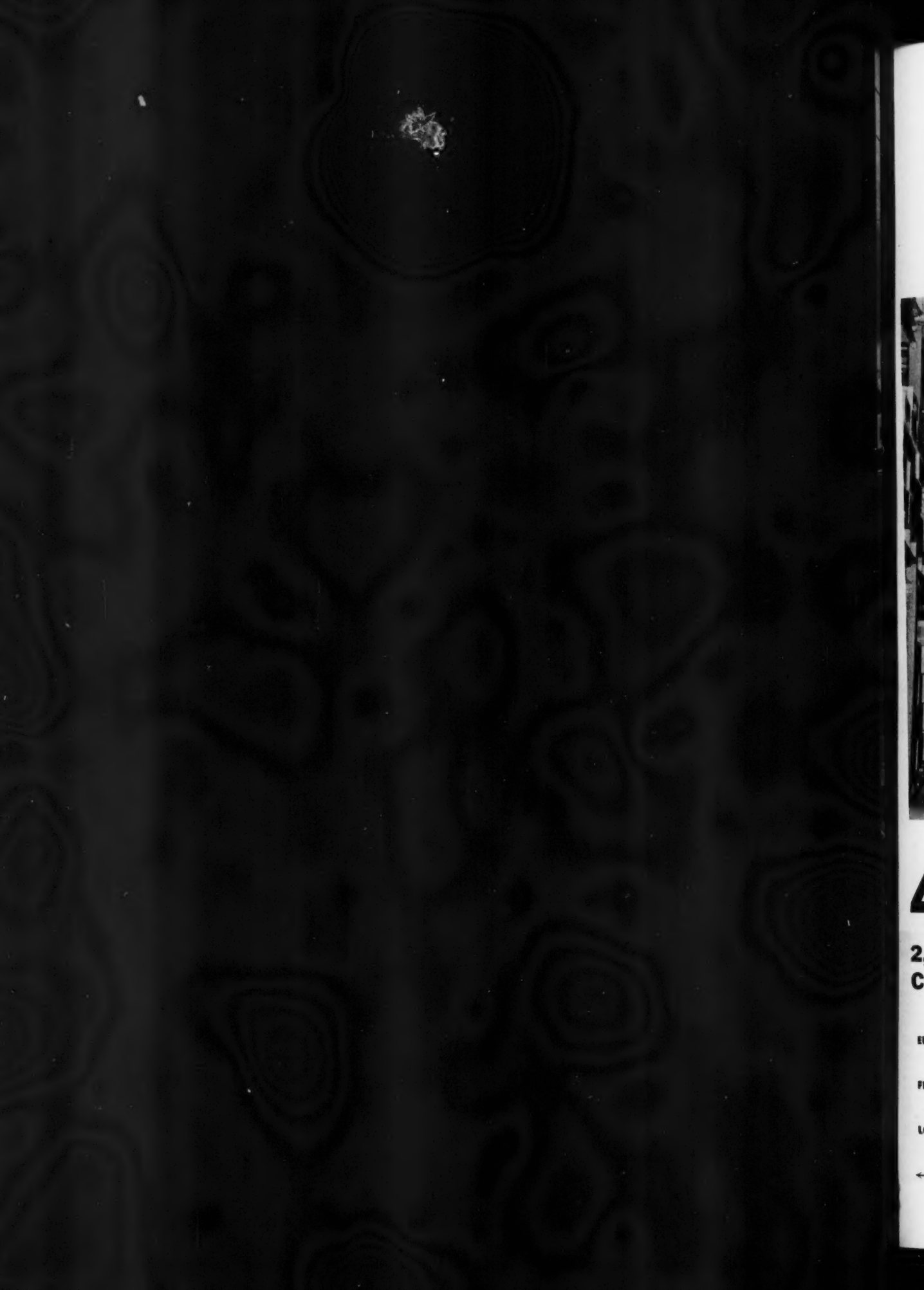


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APRIL — 1961

Vol. 26

No. 4

western
industry



SERVES THE THIRTEEN WESTERN STATES

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COVER PHOTO

ASSEMBLY OF microscopically clean parts at Astro Cleaning and Packing Corp., Downey, Calif. Technician doing this operation uses dental tool to properly position part. Most of this type of cleaning and assembly is done on West Coast.

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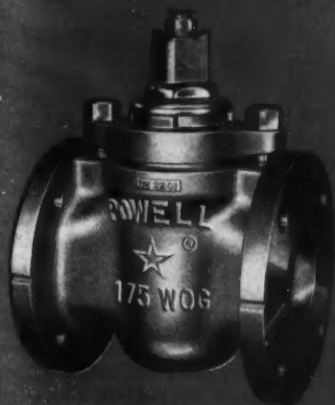
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VALUE ANALYSIS FACT SHEET

Formbrite Drawn Brass Parts

How to open finishing room bottlenecks and cut polishing costs up to 50%—produce stronger, more scratch-resistant parts—and get additional savings—with Formbrite, superfine-grain drawing brass.

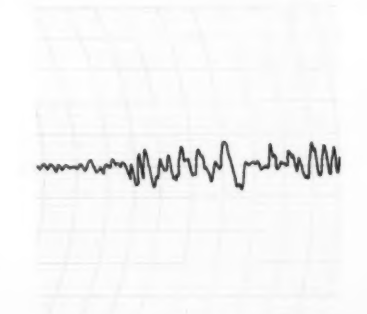
Very often in the production of drawn brass parts which are to be plated or lacquered, finishing costs are greater than those of all preceding operations—or even the cost of the metal. Under any circumstances, they are a high percentage of total costs.

Furthermore, parts go through the pressroom a lot faster than they can through the finishing room, creating bottlenecks in production.

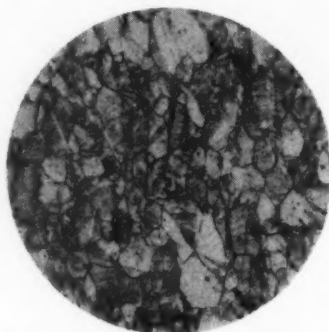
ENLARGED SURFACE TRACES at the right prove that you can lick both cost and time problems with Formbrite®, Anaconda superfine-grain drawing brass. Savings in polishing costs reported by users run from 40 to 50%. These are net savings, as Formbrite costs no more than ordinary drawing brass.

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Enlarged surface trace of standard drawing brass (grain size .045 mm) after 40% elongation. This kind of roughness causes "orange peel" effect in the working of standard drawing brass. Smoothing such mountains down to the valleys takes considerable cutting.



This is the microstructure, shown 75x, of the standard drawing brass used above.

tempers, and can be rolled in heavy coils to .004" in thickness by 24" wide, weighing 100 pounds per inch of width. The table below gives physical data and terminology for Formbrite tempers.

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This uniform superfine-grain structure of Formbrite, shown 75x, is produced by special procedures for rolling or drawing and annealing developed by Anaconda American Brass Company.

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64,000	74,000	72	82	Three-quarter-hard Yellow Brass—Formbrite
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WESTERN INDUSTRY/APRIL 1961



western meetings

Western Joint Computer Conference

THE THEME of the 1961 Western Joint Computer Conference and exhibit, "Extending Man's Intellect," will be demonstrated May 9 - 11 in Los Angeles when more than 56 firms will display \$3 million worth of computers and related equipment at the Ambassador Hotel. More than 2,500 are expected to attend what is to be the largest WJCC ever staged.

Sponsored by the National Joint Computer Committee representing the Institute of Radio Engineers, the American Institute of Electrical Engineers and the Association for Computing Machinery, the WJCC will include technical sessions and plant tours in addition to the exhibit.

All are designed to provide men who design, build and use computers an opportunity to exchange latest technical information.

The growth of the Western Joint Computer Conference, held alternately at Los Angeles and San Francisco, closely parallels the huge expansion of the computer industry in the West during the past decade, points out Dr. Walter F. Bauer, general chairman of the 1961 WJCC.

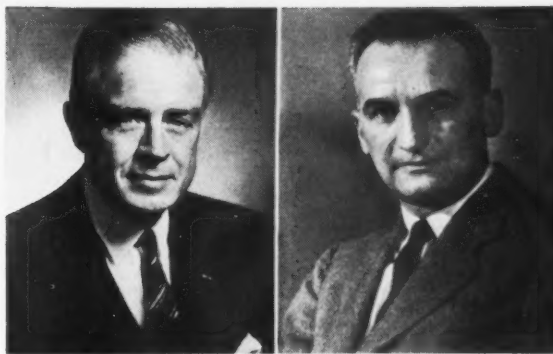
Computer industry sales in Southern California and Arizona are currently running at the rate of \$500 - \$750 million annually, 16 percent of an estimated \$3 billion national sales volume. Ten national firms in the West, including Burroughs, Librascope, Bendix, Autonetics Division of North American Aviation, ALWAC Division, National Cash Register, General Electric, and IBM are engaged in computer manufacture or research. These firms employ upwards of 200,000 engaged in research, design and manufacture, or direct use of computers.

During the three-day technical conference, 15 technical sessions featuring 67 papers will highlight phases of data handling and processing covering such topics as information retrieval, pattern recognition, automata theory and neural models, problem solving and learning machines, automatic programming, modeling human mental processes, computers in control, simulation, computers in communications and large computer systems.

Special events include tours of System Development Corp.'s Q7 (SAGE) system, and the automated teaching project (using a Bendix G15); Space Technology Laboratories' digital computer center and the physics research laboratory; Western Data Processing Center on the UCLA campus; and Ampex Computer Products Co., manufacture, test and installation of magnetic core memory devices.

Special events include a conference cocktail party at the Ambassador Hotel, Embassy Room, on Tuesday evening, May 9. There will be extensive programs for the ladies.

Dr. Bauer is supported by Keith Uncapher, RAND



FEATURE SPEAKERS at Western Joint Computer Conference are, left, Thomas Watson Jr., president of IBM, and right, Dr. Simon Ramo, Executive Vice President, Thompson Ramo Wooldridge, Inc.

Corp., vice-chairman; and Dr. Robert Rector, Space Technology Laboratories, conference administrator.

Prof. Cornelius Leondes, Department of Engineering, UCLA, is in charge of the conference program. He is being assisted by Smil Ruhman, chief electronic engineer, Packard Bell Computer; John D. Madden, director of information processing, System Development Corp., and Paul Armer, head of the computer sciences department, The RAND Corp.

Chairmen of arrangements committees for the conference include: publication, Glenn Morgan, IBM Corporation, Los Angeles; hotel arrangements, William Dobrusky, System Development Corporation; finance, William S. Speer, Electronic Engineering Data Systems, Norden Division, United Aircraft Corporation, Gardena; public relations, Santo Lanzarotta, Datamation Magazine; registration, Marvin Howard, Thompson Ramo Wooldridge, Canoga Park; exhibits, R. H. Hill, Thompson Ramo Wooldridge, Canoga Park; printing, L. C. Hobbs, Aeronutronic Division, Ford Motor Company, Newport Beach; trips, Joel Herbst, Ampex Computer Products, Culver City; and women's activities, Mrs. Phyllis Huggins, Bendix Computer Division, Bendix Corporation.

Thomas Watson, Jr., president of International Business Machines Corp., will present the keynote address at the opening session at the Ambassador Hotel on May 9. Dr. Simon Ramo, executive vice-president of Thompson Ramo Wooldridge, Inc., will discuss "Future Applications of Electronic Intelligence" as luncheon speaker May 10.

Waste Acid Disposal Problem Aired by AIPE

AN APPEAL from C. A. Wagner, Jr., of the Los Angeles Chapter, American Institute of Plant Engineers has been sent out to all members of the AIPE concerning waste acid disposal problems faced by Southland plants.

Wagner points out that about a year ago the Los Angeles County Sanitation District stated that they would have facilities at the County Sewer Farm to accept waste acids and cyanide for disposal. Construction was anticipated within 120 days.

The project, though completed at the planning stage, is to date still waiting assignment of funds. Wagner urges that interested firms write C. R. Compton, Chief Engineer and General Manager, Los Angeles County

Industrial Efficiency Report

...now...at lower cost per ton-mile,
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WESTERN INDUSTRY/APRIL 1961



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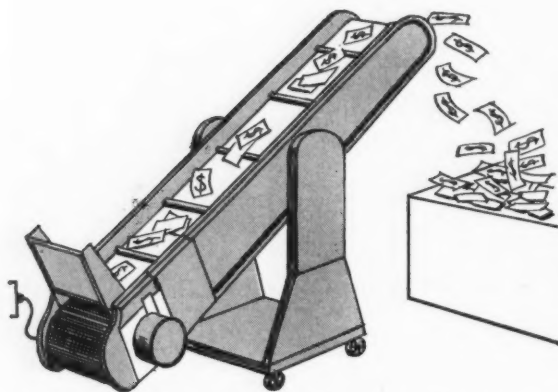
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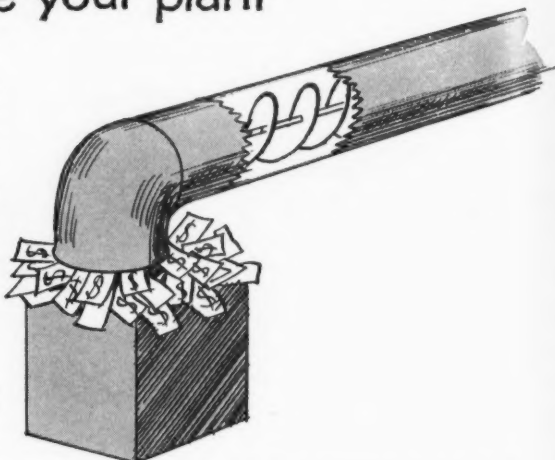
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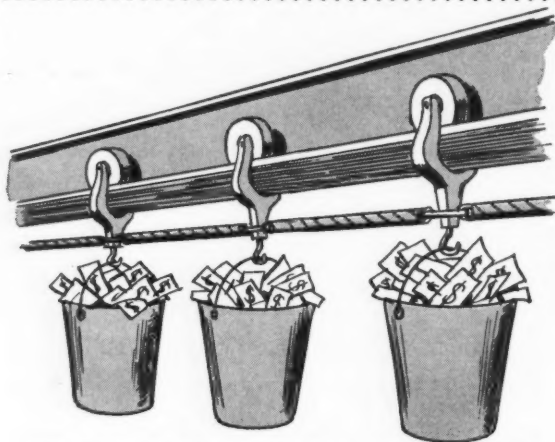
to modernize your plant



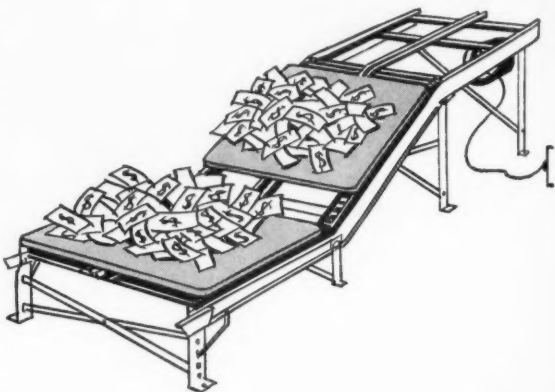
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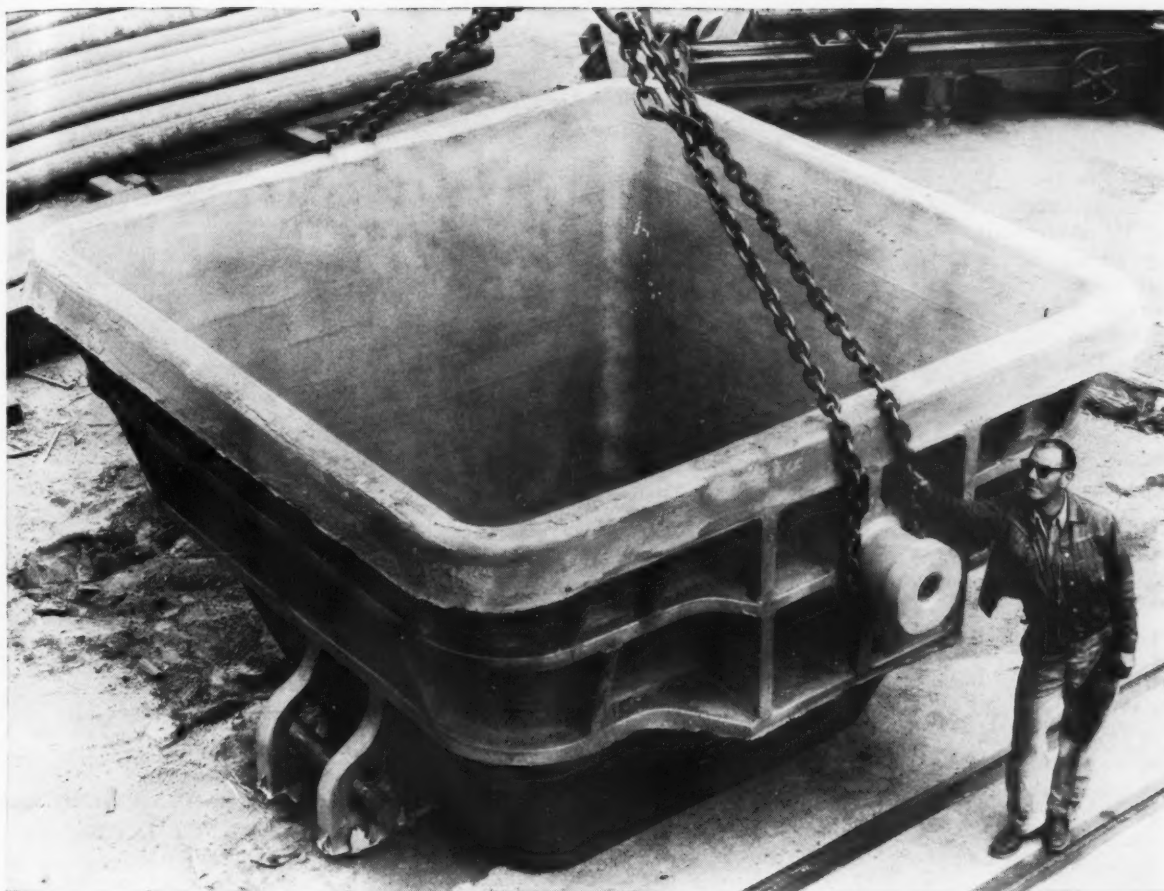
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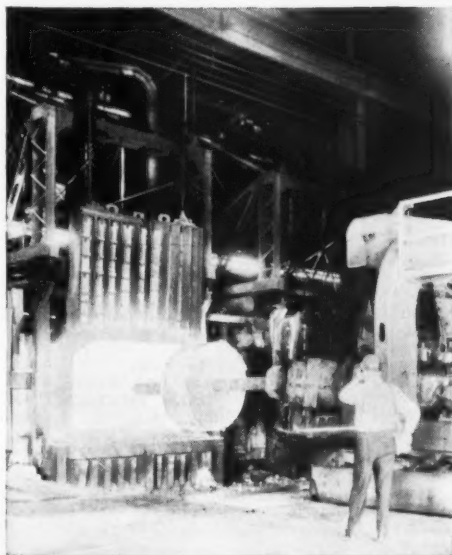
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◀ Quality control is a prime consideration at the Torrance plant, the largest integrated machinery-making plant in the West.



Steel's Symbol
of strength,
long life,
and economy

MEETINGS

(Continued from page 7)

Sanitation Districts, 2020 Beverly Blvd., Los Angeles 57, Calif. to inform him of their interest in this matter.

He points out that waste acid disposal is an expensive operation at the plant level. Wagner says that installation of disposal facilities by the County or disposal in the sea are the only other permanent solutions but that neutralization at the sewer farm should be far more economical. Wagner is chief plant engineer, Norris Thermador Corp.

Los Angeles Material Handling Meeting

HIGHLIGHTING ACTIVITIES of Los Angeles Chapter AMHS was their participation in the 8th Annual Western Safety Congress March 28-30 at the Ambassador Hotel. Heading a program during the Material Handling Sessions was Tom Brown, Exide Electric Storage Battery Co., who was general chairman of a program moderated by Andrew Briggs, and including W. B. Semco, R. F. Mollner, R. D. Wood and Wally Brucks, Los Angeles Chapter president.

Semco spoke on handling of material safely in manufacturing, and Mollner, of Cal-Cartage Co., Inc., talked on safe material handling in truck loading and unloading. Wood, representing Santa Fe Railway, described safe railcar loading and unloading and Brucks, Hunt Foods and Industries, Inc., lectured on safety in warehousing.

The March chapter meeting was addressed by Stanley W. Stanick of Universal ECSCO Corp. Stanick detailed a new system for letter and package handling flow developed by his firm for use by the United States Post Office system.

A technical session on the future of packaging was developed by Frank Weber, Chairman, AMHS National



MAKING A Los Angeles Chapter visit was Robert Rutherford, center, National President of the American Material Handling Society and flanked from left, by Ed Sullivan, vice president of AMHS Region VII and Wally Brucks, president of the Los Angeles Chapter AMHS.

Packaging Committee; Harold Kilmer, National Vice President, Society of Packaging and Handling Engineers, and Hank Waters, president of Los Angeles Chapter, SPHE. Panelists were introduced by technical session chairman Tom Rose.

Westerners Featured at Castings Congress

FOUR WEST COAST men are authors of technical papers to be presented at the American Foundrymen's Society 65th Castings Congress in San Francisco, May 8-12.

C. E. Haney, Vice President, ESCO Corporation, will present a paper at an Industrial Control and Cost Session entitled "Cost Control through Application of Process Quality Control."

In the Light Metals field William A. Bailey and Emmett N. Bossing of the Douglas Aircraft Co., Inc., Santa

Calendar of Western Meetings

Apr. 20-21—RAILROAD CONFERENCE. Sir Francis Drake Hotel, San Francisco. Jointly sponsored by American Society of Mechanical Engineers and American Institute of Electrical Engineers.

Apr. 20-21—18th ANNUAL WESTERN SECTION CONFERENCE, SOCIETY OF THE PLASTICS INDUSTRY, INC. Hotel del Coronado, Coronado, Calif. Society of the Plastics Industry, Inc.

Apr. 26-28 — TECHNICAL CONFERENCE 7th REGION IRE. Hotel Westward Ho, Phoenix, Ariz. Includes both technical sessions and exhibits. Sponsored by Institute of Radio Engineers.

May 8-12—CASTINGS CONGRESS. Brooks Hall, San Francisco. American Foundrymen's Society.

MAY 9-11—WESTERN JOINT COMPUTER CONFERENCE. Ambassador Hotel, Los Angeles. Sponsored by National Joint Computer Committee formed by Institute of Radio Engineers, American Institute of Electrical Engineers, Association for Computing Machinery.

May 16-20—PACIFIC COAST ELECTRICAL ASSOCIATION MEETING. Sheraton-Palace Hotel, San Francisco. Pacific Coast Electrical Association.

June 11-15—SUMMER ANNUAL MEETING OF ASME. Statler Hilton Hotel, Los Angeles. American Society of Mechanical Engineers.

June 1-3—MHEDA NATIONAL CONVENTION. Denver-Hilton Hotel, Denver, Colo. Material Handling Equipment Distributors Association.

June 28-30—INTERNATIONAL TRUCK, TRAILER & EQUIPMENT SHOW. Brooks Hall, San Francisco. California Trucking Associations, Inc.

June 28-30—2nd JOINT AUTOMATIC CONTROL CONFERENCE. University of Colorado, Boulder, Colorado. Sponsored by ISA, AIChE, AIEE, ASME, IRE.

July 4-7—27th ANNUAL MEETING PROFESSIONAL ENGINEERS. Olympic Hotel, Seattle, Washington. National Society of Professional Engineers.

July 18-20—WESTERN PLANT MAINTENANCE & ENGINEERING SHOW. Pan Pacific Auditorium, Los Angeles. Sponsored by Clapp & Poliak, Inc.

Aug. 22-25—1961 WESTERN ELECTRONIC SHOW & CONVENTION. Cow Palace, San Francisco. West Electronic Manufacturers Association.

Aug. 28 - Sept. 1 — INTERNATIONAL HEAT TRANSFER CONFERENCE. University of Colorado, Boulder, Colorado. Co-hosts are American Society of Mechanical Engineers and American Institute of Chemical Engineers.

Sept. 5-8—NATIONAL CONFERENCE & INTERNATIONAL DATA PROCESSING EXHIBIT. Statler-Hilton Hotel, Los Angeles, Calif. Sponsored by Association for Computing Machinery.

Sept. 13-15—CONVENTION & ANNUAL MEETING PACIFIC COAST GAS ASSOCIATION. Coronado Hotel, Coronado, Calif. Pacific Coast Gas Association.



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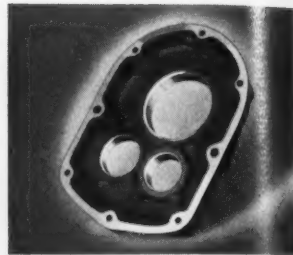
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...the quality-engineered package
that simplifies speed reduction

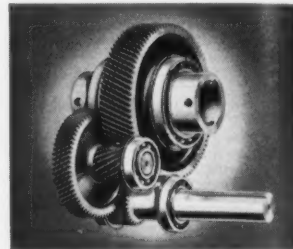


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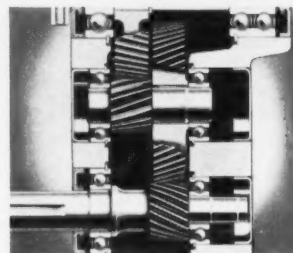
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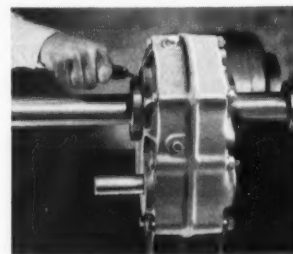
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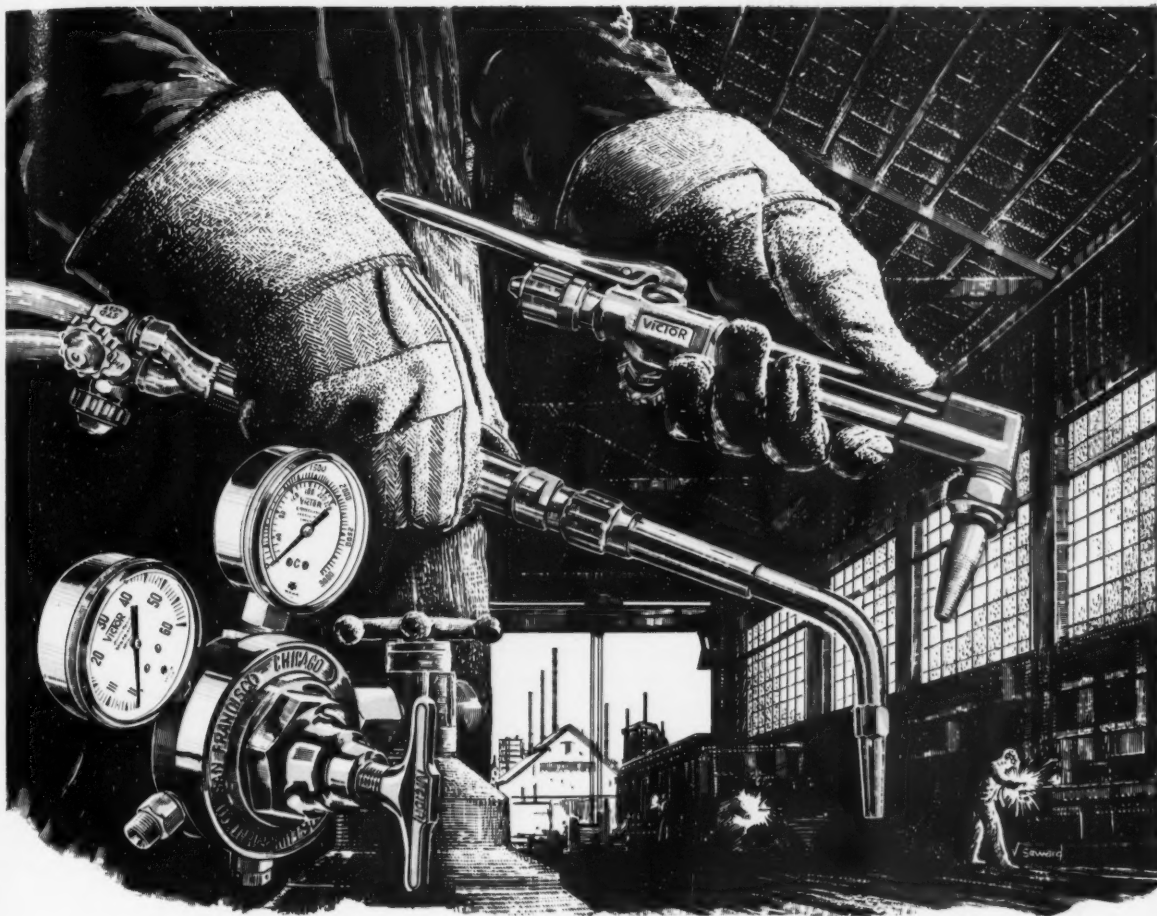
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MEETINGS

(Continued from page 12)

Monica Division, Santa Monica, California, will give a paper on "Progress in High Strength Aluminum Alloy Castings of Air Frames."

For a Die Casting session A. J. Iler of Northrup Corporation, Norair Division, Hawthorne, California, will talk on "The Effects of Centrifugal Force on Sub-Structure of Aluminum Alloy 356 + BE Permanent Mold Castings."

New Product Exhibit and Conference Slated for Los Angeles in September

THE THIRD ANNUAL New Product Exhibit and Conference, sponsored by the diversification and licensing committees of the Los Angeles Chamber of Commerce has been scheduled for September 6, 7 and 8.

The event is specifically designed to bring inventors and firms with new products together with others offering financial, sales, production and engineering facilities. In one concentrated area, business executives can exchange information and make preliminary contacts for new business development.

One hundred and two exhibitors will be invited to present their ideas and merchandise at the Los Angeles Ambassador Hotel. These firms will represent a broad

cross section of American and foreign business opportunities according to Chairman John Oliver, whose committee is coordinating all activities.

L.A. Chamber of Commerce Head



IN CEREMONIES attended by more than 900 Los Angeles Chamber of Commerce members and guests, Harold C. McClellan, president of Old Colony Paint & Chemical Corp., center, was installed 1961 Chamber president. Flanking McClellan, from left are, James S. Cantlen, vice president-general mgr., Pacific Telephone; J. D. McCall, president, US Steel, Columbia Geneva Div.; Roger M. Blough, board chairman, US Steel Corp.; and Charles W. Lee, president US Steel, Consolidated Western Steel Div.

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HARNISCHFEGER
Milwaukee 46, Wisconsin



(Continued from page 16)

Show Will Help Solve Unique Western Need for New Maintenance Techniques

THE WEST is leading the nation in factory maintenance problems because of big nuclear development, it was stated by a well-known sponsor of the Western Plant Maintenance & Engineering Show scheduled for the Los Angeles Pan Pacific Auditorium, July 18-20.

The phenomenal growth of highly technical Western industries such as electronics, radioactive metals, aircraft and missiles is stimulating a unique regional demand for new techniques in plant maintenance and engineering, according to R. L. Saling, Regional Manager, Maintenance Products, Westinghouse Electric Corp.

"We can no longer think of plant maintenance in yesterday's terms when we're using explosive metals, radioactive isotopes, precision instruments and complex automatic machinery," he said. "Modern industry in the West requires modern maintenance engineering."

Saling singled out the atomic energy field as one that involves specialized techniques of plant engineering and maintenance.

In using radioactive materials, a manufacturer must make special provisions for ventilation, cleaning, insulation, employee protection and disposal of wastes. The handling of these materials is regulated by a detailed Federal code, but the manufacturer has latitude to increase the efficiency of his own operations.

"A plant using radioactive materials offers many examples of our new reliance on sound maintenance engineering," Saling said. For instance, an ordinary concrete floor won't do because of the danger of contamination if materials are spilled. What form of impervious material should be used? What sort of disposable coverings are appropriate? In handling certain alloys, a plant must humidify its air to prevent static electricity in ventilators. Some alloys must be enclosed in resistant shields."

According to spokesmen for the Atomic Energy Commission, there are now approximately 1200 firms and individuals in California alone licensed to handle radioactive materials. The number of licenses is increasing by approximately 5 per cent yearly. Industries using radioactive isotopes include petroleum refining, fertilizers, plastics, radiographics and metals.

The AEC spokesman estimated that American manufacturers save about \$500,000,000 a year through the use of radioactive isotopes.

Saul Poliak of Clapp & Poliak, Inc., producers of the Western Plant Maintenance & Engineering Show, said that the tempo of industrialization of the West would undoubtedly be reflected by increased attendance at the exhibition, which has attracted well over 6,000 specialized buyers in past years.

Los Angeles, site of the show and conference, is surpassed in industrial productivity by only the New York and Chicago metropolitan areas. Slightly more than 16,000 Los Angeles manufacturing concerns employ 700,000 workers and produce \$7 billion worth of products every year.



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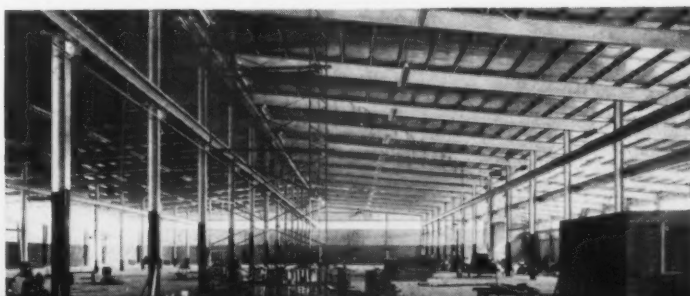
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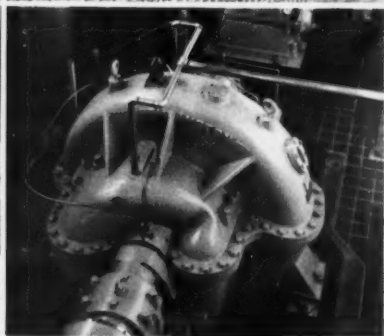
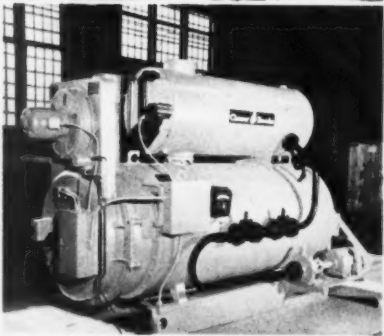
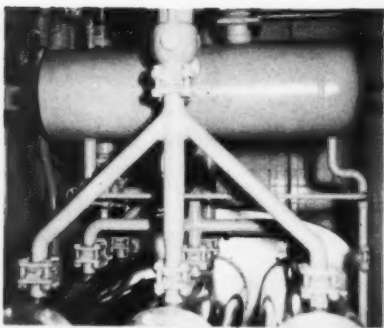
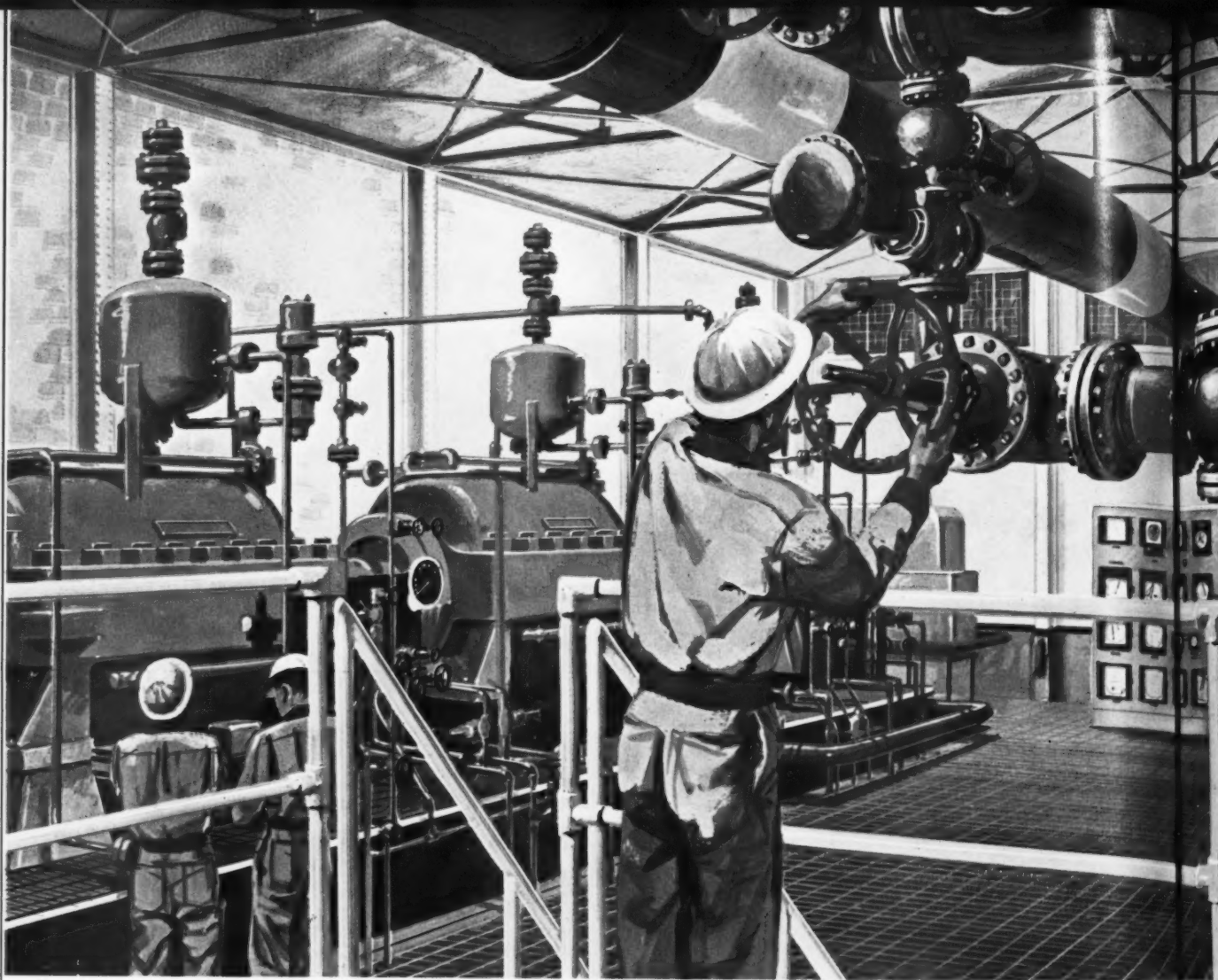
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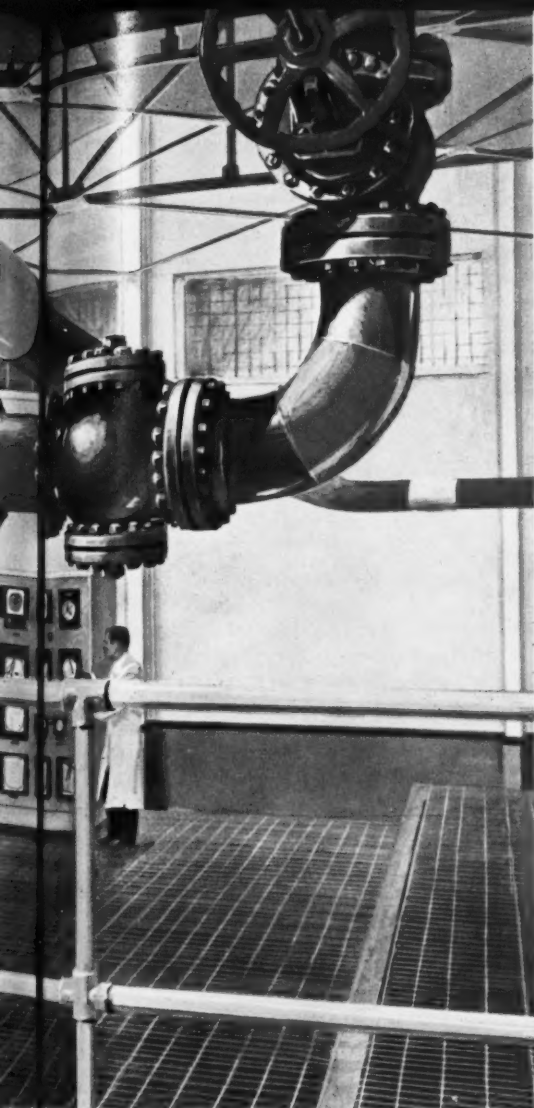
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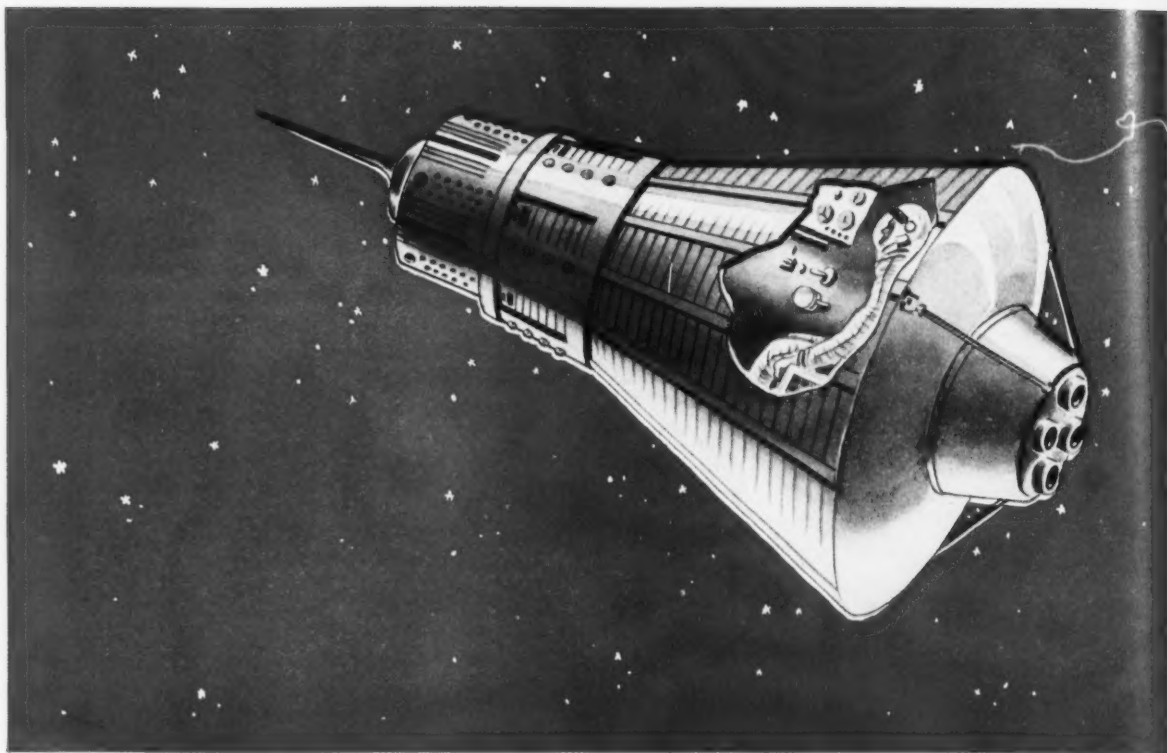


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APRIL 1961

Vol. 26 No. 4

western
industry



➡
DRESSED LIKE surgery assistants and working in a room pressurized with highly filtered dehydrated air, these men inspect, assemble and proof test cleaned components and subassemblies.



MICROSCOPIC CLEANING a predominantly western operation

In five short years a new parts cleaning technique has been developed to meet exacting standards of the missile industry.

IN FIVE YEARS missile fluid system decontamination has become an exacting and indispensable part of the propulsion industry. Today the cleaning to microscopic levels, subsequent inspection and final custom packing of thousands of fluid system components represents an estimated 5% of the cost of some of the advanced vehicles and missiles.

"Over 65% of the propulsion industry has to have at least part of its production decontaminated," reports James St. Clair, president of Astro Cleaning and Packing Corp. of Downey, California. "Somewhere between 25,000 and 30,000 of the parts produced by an estimated 15,000 subcontractors in the

Atlas program have to be decontaminated to microscopic levels."

Most of this work is done on the West Coast, making the field one that is predominantly Western. Much of it is handled by specialized cleaning firms. Astro-Pak's operations typify this specialized function of reducing component contamination to the exceptionally low levels demanded by our sophisticated propulsion systems.

In addition to having facility approval from AF, Navy, Corps of Engineers, Ordnance, Ballistic Missile Office and NASA, decontamination subcontractors have to respond to the specific demands of near-



OPERATOR PLACES PAN of parts in this all stainless steel vacuum dehydrator. This clean room equipment is used for thorough drying of intricate parts. Unit is pyrometer controlled to plus or minus one-half degree through use of six thermocouples.

ly 70 different sets of manufacturer specifications ranging in length from several pages to a three-inch thick volume.

Biggest concern is for hydrocarbon contamination. In Magnitude this runs from a thumb print to oily residues left from manufacturing processes. All have proven disastrous to the proper functioning of fluid system valves.

Foreign particles — flecks as small as 65 microns — can similarly cause component rejection. Looking for particles this size, removing them, then protecting the component from additional contamination during assembly and testing is a job which finds few parallels in vocational frustration.

Under conditions that are frequently, and correctly, compared to those of a modern surgery, sub-assemblies are first disassembled, then bathed in filtered cleansing solutions, finally rinsed and dried.

Specifications vary somewhat, but the most common practice is to go to a vapor degreasing, then an alkaline wash, finally a spray rinse with deionized water.

In the normal first step, vapors from heated (180°) trichlorethylene condense on the part. In

the process of running off, this distillate degreases the part, then passes through 10 micron filters before reuse.

Deionization of the rinse water removes soluble particles down to 10 parts per million. Insoluble particles are simultaneously removed by 6 micron filters.

Though this looks easy and sounds easy, it isn't. The operations are performed in a clean room, a brightly lighted room with large plate glass windows resembling a surgery. The men inside are dressed in hospital garb with medical caps and gowns, plastic gloves, and white nylon boots over their shoes. Signs on the wall give a clean room etiquette.

The clean room provides a carefully controlled environment for inspecting, assembling and proof-testing. Everything that goes into the room, from the air breathed to the clothes worn and tools used, is decontaminated. You can't sneeze; you can't put your hands in your pockets. You handle everything with plastic gloves.

Dehumidified air filtered to 2 microns is pumped into Astro-Pak's clean rooms at 1800 CFM. Cool enough to hedge against perspiration, it also mod-

estly pressurizes the room against infiltration of dust or other contaminants. The very best job of decontamination can be quickly undone by poor air control during the critical testing, inspection and packing.

Contamination testing is handled in several ways, and always in the clean room. Hydrocarbon contamination, the biggest concern, but not necessarily the biggest problem, is searched for with an ultraviolet "blacklight," which turns traces of hydrocarbon a fluorescent yellow.

Particular contaminants, anything from a speck of dust on up, are hardest to control. Ranging from a metal filing to a fleck of dandruff, they are carefully retrieved by the inspectors, then measured under a 100-power microscope.

If maximum allowable particle size is 175 microns, 1/7000 of an inch, and a 250 micron particle is found on a significant surface, the part is rejected and goes through the entire cleaning cycle again.

Though a variety of particular inspections can be used, solvent extraction is most common. Using a highly filtered solvent like trichlorethylene, the part is washed, the retrieved solvent filtered and the residue on the filter measured.

Other tests include the "wipe test" for excessive discoloration, the "water break" test for hydrocarbon film and testing by the total weight of solid extraction.

Once tested and approved, parts go into another clean room for contamination-proof packing in 10 mil polyethylene.

In the course of a month, the firm uses as much as 6000 linear feet of this material in widths of from 1" to six feet. In many instances they double pack, putting humidity indicators in the outer bag.

Significantly, one of the biggest problems facing the decontamination industry is that of locating equipment and materials that satisfy its unique demands for cleanliness. Many items are modifications of equipment obtainable only through surplus stores, and sheer luck has turned up other supply sources. It was by accident that they found dental probes make the ideal tool for careful removal of seals during disassembly.

Parts drying required a specially designed vacuum dehydrator (to 600⁰ and 29.6" mercury in 15 minutes). A hydraulic-pneumatic test stand had to be devised so all pumps and motors were outside the clean room.

A manufacturer of special sealing and finishing compounds (Watco) only recently eliminated one of the industry's biggest trouble makers — dust from concrete floors — by compounding a material that seals through penetration and polymerization.

But for the most part Astro-Pak, and their opposite numbers elsewhere, exist without benefit of supporting supplier industries. They have no precedents, no research or consultive service that can give practical answers as fast as they're usually needed.

"The problem," succinctly observes one manufacturer of field system components, "is to take common equipment and maintain it in uncommonly clean condition."



USING A 100 power microscope, inspector searches a Milipore filter disc for decontaminating particles in solvent extraction test.



INSERTING THE by-pass poppit assembly into filter body. Following microscopic and ultraviolet inspection for contamination, the X-15 filter is carefully reassembled by manufacturers' technicians.



AN EDITORIAL

HIDDEN THREAT to western industrial firms

Western industrial complex is tied together by truck network. Passage of proposed truck tax for highways will hit Western firms hard.

INDUSTRY IN THE WEST is facing a serious economic threat. The threat is doubly serious because it is hidden, and therefore not easily recognized by those who stand to suffer the most, Western industrial plants. We are referring to the proposed taxation of the trucking industry to pay for our national highway network.

Let us see what will happen to industry in the 11 Western states if this proposed legislation is enacted into law. We will not go into the dollars and cents provisions other than to state that it is an extremely heavy tax aimed at raising some \$300 million a year from taxes on truck licenses, diesel fuel, and truck tires. As such it will increase trucking costs considerably. To compensate for this heavy burden, it is a foregone conclusion that trucking rates will be increased in somewhat equal proportion. We have seen this same thing happen in the price of steel, automobiles, and other commodities.

What does this mean to Western industrial firms? Simply this. They will be forced to pay a disproportionate share of the costs, for no other part of the nation depends upon shipping by trucks so completely as does the West. Of the 80 billion miles of truck travel in the country almost 40% is in the 11 Western states.

Without detracting from the importance of rail shipments it is obvious that our Western industrial complex is connected by truck in much the same manner as the industrial East is by rail. In California, for instance, of over 4000 communities, over one-half have no transportation service other than by truck. Again in California, in excess of 85% of the intrastate for-hire revenues goes to the trucking industry. Nationwide, truck revenues account for less

than one-half. Many Western plants depend almost entirely on truck shipments. It is not a question of choice. There is no other way for them to ship.

It is fairly obvious that the economy of the West has paralleled the increased use of the motor vehicle during the last 40 years. Not only do Western plants use trucking firms for shipping but many firms in this area own their own fleets of trucks, fleets that will also be subject to this tax.

As a result Western industrial firms will pay a much greater cost for shipments than before. How high the cost might be no one can say, but it will be disproportionate with the rest of the country and it will cause an increase in manufacturing costs that will make a Western industrial firm's position even more difficult marketwise than it is now.

Let us look at the problems a manufacturing firm in the West faces. Since World War II the industrial West has grown rapidly. This growth has reached the point where the West has become a significant force in our national economic structure. Throughout this period our Western industries have grown in spite of, and not because of manufacturing differences with their Eastern counterparts. A Western manufacturing firm starts out at a distinct disadvantage in costs. Labor is higher. Manufacturing volume is lower, making manufacturing costs higher. Basic raw materials, parts and equipment all cost more because they are shipped from the East or transported over long distances in the West.

With this new proposed legislation it appears that Western industrial firms will be forced unfairly to assume shipping costs disproportionate with the rest of the country. This will place the Western manufacturer at an even greater disadvantage.

NATURAL LIGHTING achieved thru plant design

Sawtooth roofing, long obsolete in the East, is being revived in the West where the many days of sunlight make natural plant lighting practical.

HERE IN THE WEST where new plants and expansions are reported daily there is a unique opportunity to utilize natural sunlight for plant lighting. Because there are more days of sunshine in the West than in other areas of the country, potential plant builders may find it economically advantageous to use this natural sunlight. Its use is also desirable for precision part assembly work.

One Western company that recently completed an expansion program designed its new buildings to take advantage of natural lighting. Situated on a low hilltop in Stanford Industrial Park, Palo Alto, California, the Hewlett-Packard Co. built four rectangular, two-story buildings on different elevations surrounding a 43,000 sq. ft. patio.

The glass-fronted buildings face north so that interior areas receive maximum benefit of the north light and avoid direct sunlight. Sawtooth roofing enhances the natural light so that the light level on the four upper floors is 200 foot candles or better during the day. Sawtooth roofing is not new in plant design. In fact it has generally been discarded in modern eastern plants. Here in the West however, because of the difference in the amount of natural light available, this type of plant design has many advantages.

It is on the upper floors that the production personnel do the precise work of final assembly and testing on the company's electronic measuring devices. Floor space on the upper floor of Building #4 is a gross area of 42,000 sq. ft. and a usable area of 39,500 sq. ft.

On rare grey or rainy days, fluorescent lights, two rows to a bay, bring the natural light to the correct foot candle level. The fluorescents shown in the photograph are No. KMBX-6500 series with a particular modification for Hewlett-Packard, and are made by Globe Lighting Products, Inc., Los Angeles. The fluorescents used in Building #4 and in the warehouse are Westinghouse products. Elsewhere in the plant, on both floors, Sylvania fluorescents are installed.

Fluorescent lights are controlled by a photo electric eye sun switch system which automatically turns lights on when the natural light level drops to 100 foot candles and turns them off at about 140 foot candles. This is an automatic Honeywell light-saver system.

On the lower floors that house the heavy equip-



FLUORESCENT LIGHTS, two rows to a bay, automatically go on or off in correlation with outside lighting. Fixtures used on upper floor of Bldg. #4 are No. KMBX-6500 series made by Globe Lighting Products, Inc., Los Angeles, California.



SAWTOOTH ROOFING used by Hewlett Packard Co. in their new Palo Alto, California plant captures natural daylight. All four buildings, located on a hilltop, have a northern exposure. Company employs about 2,300 persons in design and manufacture of precision electronic measuring instruments.

ment and machine shops, the fluorescent fixtures provide 75 to 120 foot candles, depending upon area requirements.

The only function of the sawtooth roofing, according to plant engineer, Phil Towle, is to utilize the north light. Although Hewlett-Packard has open floors with no partitions except in the engineering department, the use of partitions for offices or sections would reduce the light level only slightly.



GENERAL VIEW of foundry at Ampco, bought, remodeled and moved into. Operation is a sound inexpensive method of plant expansion that is finding favor with a growing number of firms in the West.

PLANT MOVE requires facility planning

This firm expanded in the West by moving into and remodeling a larger existing plant facility.

RECENTLY MOVED into a completely remodeled and enlarged Huntington Park, Calif. facility is Ampco Metal Inc., West Coast Div., a firm unique in that it is the only foundry and service center West of the Rockies from which practically all copper base alloys are available in all forms.

Ampco had a number of goals in mind in redesigning the Huntington Park layout, according to Gordon E. Brown, Div. Sales Manager. Foremost was the modification of what had been an iron foundry into a centrifugal and sand casting facility, and inclusion of a complete interior metal storage area.

Redesign of the foundry was carefully planned in order to provide a separate area for each function

and to avoid overflow of equipment and material that would hamper efficiency. Departments were located either in separate rooms or in clearly defined areas with related functions placed in adjacent positions.

Since the foundry was purchased with much of the former firm's equipment still on the floor, existing fuel-oil fired ferrous melting facilities were removed and replaced by pit furnaces and five 1000 pound capacity furnaces. To service the later from overhead, a wooden melting platform was removed and replaced with a safer permanent cement structure.

Production flow in general was planned from the rear of the foundry to the front. Scrap storage, fire-

proof pattern storage, pattern department, core facilities, molding bays and melting stations are to the rear. Heat treating, shot blasting, and grinding operations are segregated to one side of the building in separate areas. Machining operations occupy a separate bay on the opposite side.

Metal inventories and the shipping department are located frontmost in the building. Office, engineering, and administrative functions that once occupied offices in the foundry were taken completely from the main building and housed in a new structure.

The center of the foundry is virtually clear and installation of new overhead crane facilities allows this area to be used for maneuvering larger and harder-to-handle castings for dispatch to service areas.

An existing 3-ton crane was moved forward in the building and augmented by a new 5-ton capacity crane to more than double Ampco pouring capabilities. The firm can now pour 8-tons double up out of two pots.

The shipping room was equipped with a 2-ton model hoist and 1-ton capacity hoists were installed in the molding area.

New electric powered material handling equipment and other installations required rewiring of an obsolete 600 ampere electrical system and replacement with 1400 ampere service.

As a customer service and to prevent oxidation by weathering and to retain bright metal finished goods, inventories were moved indoors and maintained in steel storage racks.

Scrap is also stored indoors and handling is centered in a separate room. Scrap is segregated by type and is stored in marked palletainers. Accurate charges are rapidly made up by fork trucking containerized scrap to the scale.

To protect patterns from weather and fire danger a separate fireproof room has been fitted with storage racks bearing letter and numerical designations for rapid location.

As an aid to worker comfort and to improve overall ventilation of the foundry, fresh air inlets were installed near the roof line and three large exhaust fans were placed over the melting line.

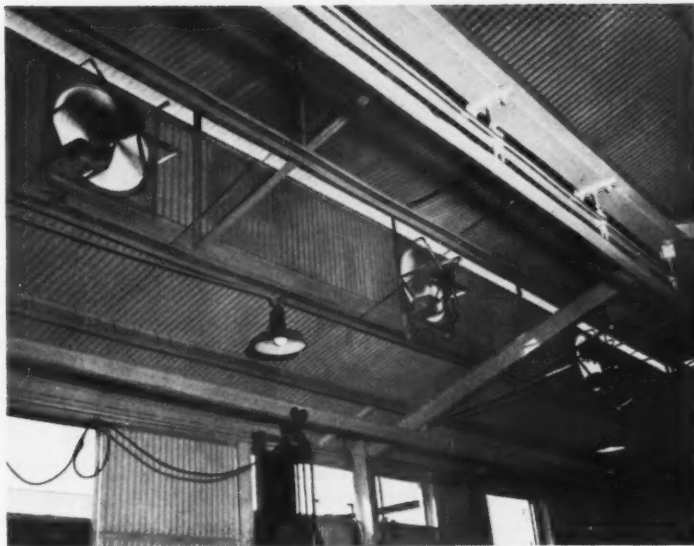
The roof was modified to include new windows for increased illumination of work areas. The entire foundry interior is painted a reflective white tone to further enhance daylight and artificial illumination.

To save time in sand handling operations and to keep different grades of expensive oil bonded molding sand segregated, separate bays were constructed to house different grades.

Foundry output is varied and includes centrifugal castings up to 1000 pounds and 24-in. OD, sand castings up to 9000 pounds poured weight. In addition to high conductivity alloys, Ampco produces and stocks a large inventory of oxygen free, high conductivity forging billets up to 10-in. OD.

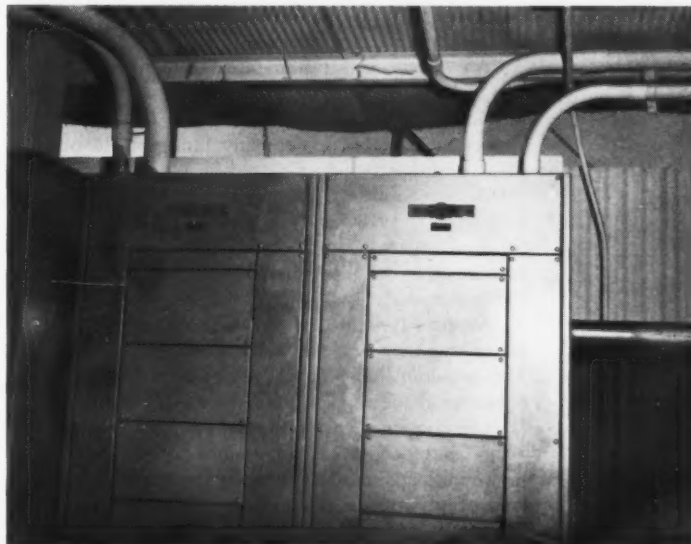
They are specialists in aluminum and bronze alloys, electrolytic coppers, manganese bronze and alloyed bronzes containing tin, lead, and in production of aluminum castings of above normal size and weight.

The West Coast division also stocks non-sparking tools, welding tips, holders and accessories.



TO IMPROVE VENTILATION SYSTEM walls near roofline were modified to hold three high capacity exhaust fans. Fans service area directly over melting platform where bank of furnaces are charged from overhead.

PART OF COMPLETELY new wiring system includes this Bulldog switch panel. Original foundry was under-powered and revamping operation included installation of 1400 ampere service. Note ample ventilation area between roof and wall for foundry heat dissipation.





PRIOR TO DEPARTING from Arcata Plywood Co. plant, driver secures folded Sealdtanks on top of payload. Folded tanks occupy negligible amount of room, are light enough to be moved by one man.



SEALDTANK IS FILLED with 20,000 pounds of glue at Reichold Chemical Co. and driver checks valve for tightness. Tanks are lashed to the truck with the same rigging used for the payload.

COLLAPSIBLE RUBBER CONTAINER used for transportation of liquids

Device can be used on standard truck, saving cost of specialized vehicle. Savings is \$275 per trip.

HANDLING OF INDUSTRIAL liquid commodities and their shipment from source to manufacturing site can be a difficult and expensive operation. The plant either pays delivery costs charged by the supplier or it must provide its own method of transport from the source.

An Arcata, Calif. manufacturer of plywood products was faced with the need for plywood glue and his source was Reichold Chemical Co., near San Francisco. Use of a company tank vehicle or that of a contractual shipper would be too costly.

By the nature of the cargo, a tank vehicle operator would have difficulty in finding a liquid shipment for a return run with the result that the tanker would return empty with operating costs practically as high as when loaded.

Arcata Plywood Co. turned to use of two 20,000 pound capacity Sealdtanks made by US Rubber Co. The Sealdtank is a large, collapsible tubular rubber container made especially for packaging of liquids.

The container when emptied can be rolled up like a rug and occupies a minimum of space. Arcata Plywood loads two folded Sealdtanks on top of a load of plywood sheets destined for delivery in San Francisco. After delivery of the payload, truck and

trailer is dispatched to Reichold Chemical bulk delivery area and each container is filled with 20,000 pounds of glue.

The filled tank occupies basically the same area as the plywood load and can be tied down with the same equipment used for the wood. Tanks are fitted with a valve and coupler system that mates with delivery lines at the tank farm.

The firm has avoided a dead-head run into San Francisco and estimates operating savings of \$275.00 per round trip.

Sealdtank containers are used to package a wide variety of liquids in the West for both the manufacturing and food processing industry. Included in cargoes is phosphoric acid, fish oils, diesel fuels, glue resins, liquid fertilizers, and a wide variety of bulk foods either in liquid form or suspended in liquid.

Both ends of the Sealdtank are sealed by flexible metal closures to allow expansion and contraction of the lading during handling and shipment without need for open venting. This eliminates danger from release of explosive or noxious vapors.

Since the container collapses as it empties, the lading does not come in contact with the air and oxidation or other spoilage is eliminated.

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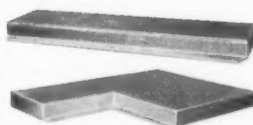
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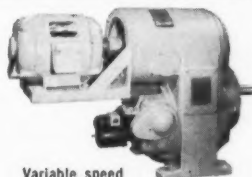
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CONVEYOR LINE increases work flow

Interesting feature is manually propelled "cages" for order picking, which when filled are dispatched in groups to packaging area.

INSTALLATION OF AN OVERHEAD recirculating box storage conveyor system has cut manual handling and has released valuable floor space for production needs at the 150,000 sq. ft. Van Nuys, Calif. plant of Rose Marie Reid Co.

Due to increased production, plant engineers were forced to improve methods of handling large stacks of telescoping boxes. Greatest obstacle to overcome was to provide a method of suspending a cube from an overhead conveyor, 12-in. by 10-in. by 36-in. long consisting of ten cartons in a stack held together by wrapping string.

Chainveyor Corp. huddled with plant engineers and devised a special hook approximately 8-in. long and 1/4-in. OD that resembled a crochet needle in that the notched end of the hook engaged the binding string to lift off the stacked boxes.

Importance of the hook was to minimize effort required to rapidly load boxes in a storage area and unload them in a production area. The conveyor system is 170-ft. long and incorporates two 30 degree elevation changes using standard 16-in. radius curves. Conveyor loading is approximately 10 pounds per ft.

Operating in conjunction with this system is a free overhead conveyor line that is minimizing handling during order picking and has increased work flow. Cartons are pulled from a series of inclined storage racks that are self-replenishing.

Cartons rest on ball bearing runners. As the front-most carton is pulled the remaining cartons are gravity fed forward to fill the void. Workers save time by not having to reach deep into storage racks to find cartons.

When removed from the racks cartons are placed in carriers suspended from the overhead track. Each carrier or "cage" holds approximately 18 units and is manually propelled between racks during order picking. When filled, carriers are dispatched singly or in chain-linked groups to a bulk packaging area for unloading and dispatch back to storage bays.

The flow rack system extends the entire length of the material handling area and is capable of holding 206,000 cartons if storage space on top of the racks is utilized.



SUSPENDED FROM A FREE TRACK are carriers or "cages" that are hand propelled down aisles between storage racks during order picking operations. Cartons rest on inclined ball bearing rollers that make shelves self-replenishing.

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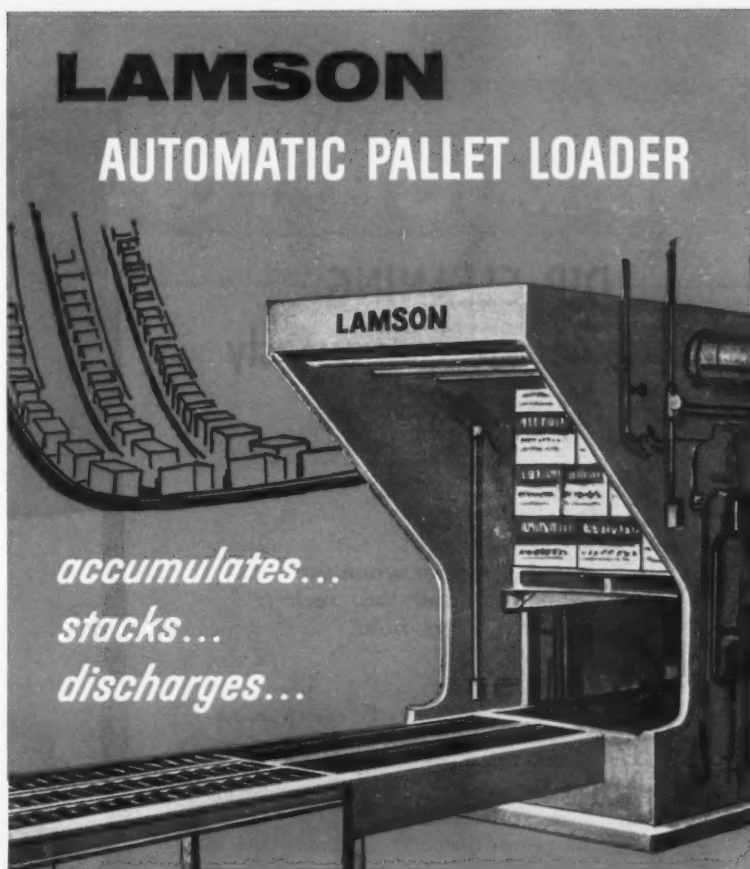
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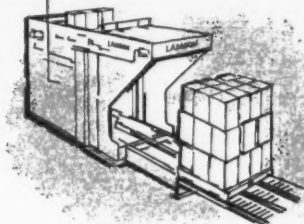
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Fully automatic, the LAMSON LOADER drastically reduces man hours per pallet load and eliminates almost all handling personnel. More uniform pallet loads materially reduce damage and breakage to units in transit.

LAMSON PACKAGE LOADERS can stack, in any one of 18 pre-selected patterns, cartons or cases that range from 9" to 24" in length; 8 3/8" to 18" in width. Pallet loads may measure up to 52" in width; 50" in length; 71" in height and reach a maximum of 3500 lbs. on the standard machine. Special models accommodate larger pallet loads.

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DIP CLEANING

portable unit continuously
reclaims solvent

Solvents last longer when used
in small degreaser that recir-
culates and filters fluid.

IN SEARCHING FOR ECONOMY during produc-
tion Western plants are turning to reclamation and
reuse of many items, among them solvents and
degreasing compounds such as naptha, a common
and relatively inexpensive fluid.

Plant operators are finding that solvents low in
initial cost may mount to staggering figures at year-
end if continually discarded after residues and con-
taminants render them useless for fine cleaning
operations.

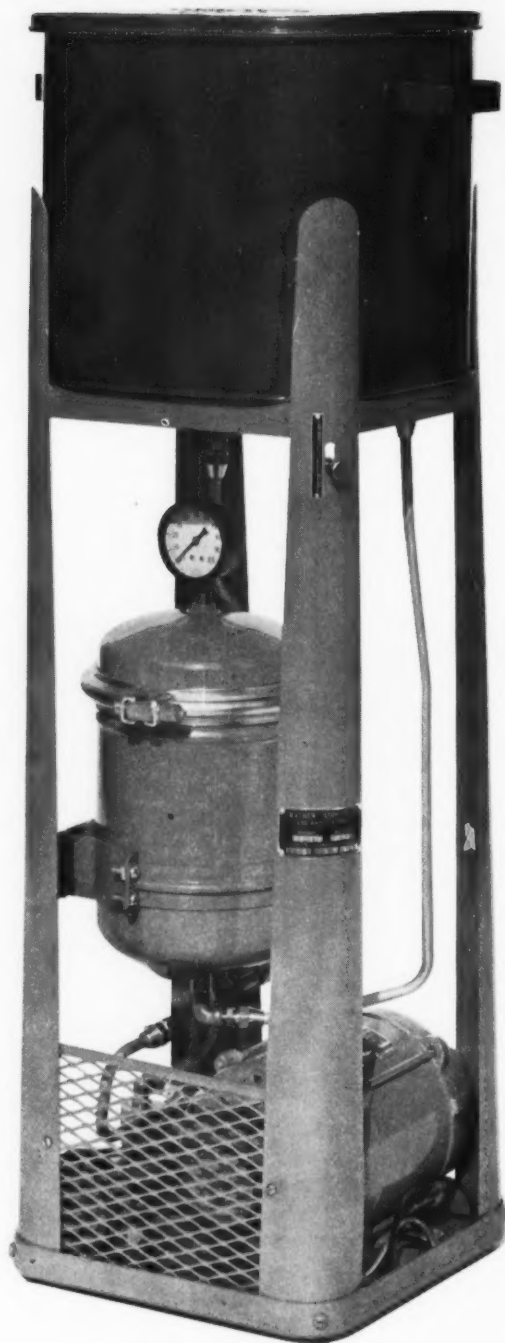
At the Glendale, Calif. plant of General Controls,
certain finely machined parts were being subjected to
a hand dipping process at the final assembly area
prior to inclusion in precision controls. Although
the parts had undergone prior cleaning operations,
naptha used as a degreasing compound still became
rapidly contaminated, was periodically discarded and
replenished.

Supplanting this hand operation is a Mayhew
Products Co. solvent parts cleaning system model
MS 272 that functions on a four gallon reservoir of
naptha that is recirculated through a one gallon
Fullers earth liquid purifier to permit constant reuse
of the solvent.

Fullers earth media in the element will pull out
solids, acids, moisture, wax, and gums down to micron-
sized particles. Control parts placed in a tray are
immersed in the 12-in. by 12-in. by 40-in. tank that
has an automatic fireproof lid. In case of a flash
fire, heat generated will contract a thermostatic metal
fitting in the lid hinge causing it to slam shut to
starve the fire.

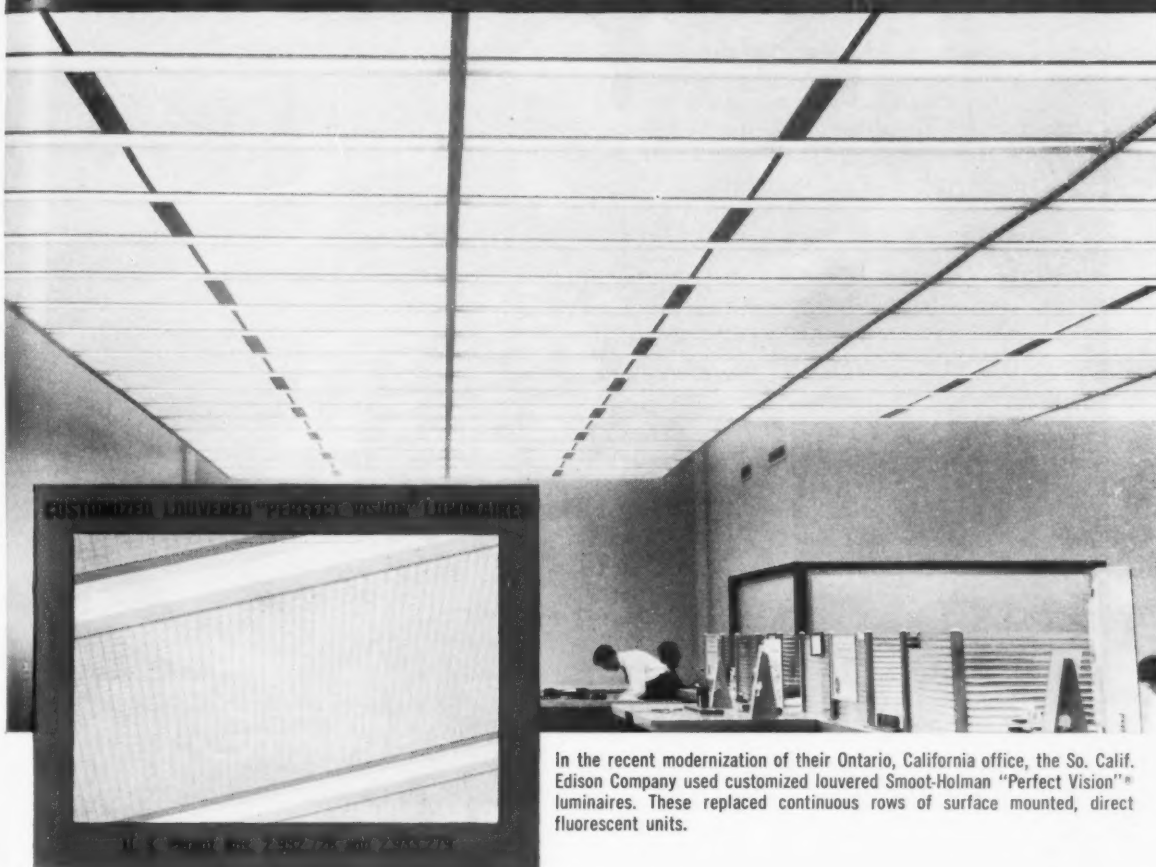
A 1.5 G.P.M. rotary gear pump is powered by an
explosion-proof motor running on 115 V. ac. Naptha
is pumped through the filtration system at 55 psi and
surges back into the cleaning tank in a whirlpool ac-
tion designed to thoroughly flood the parts tray.

In addition to reclamation value, the machine can
save bench time formerly spent on disposal of solvent,
flushing and refilling of small cleaning tanks.



*USED FOR CLEANING OPERATIONS with
constantly purified and recirculated solvents
such as naptha and trichlorethylene is this parts
cleaning system. One-gallon Fullers earth fil-
tering element, below tank, receives solvent at
55 psi, removes all acids, gums, moisture and
micron sized particles.*

new "ceiling of light" from **SMOOT-HOLMAN**



In the recent modernization of their Ontario, California office, the So. Calif. Edison Company used customized louvered Smoot-Holman "Perfect Vision"® luminaires. These replaced continuous rows of surface mounted, direct fluorescent units.

HERE'S WHY SO. CALIF. EDISON CHOSE "PVs"

● **REMODELING COSTS GREATLY REDUCED — NO NEW CEILING REQUIRED.** This customized "Perfect Vision"® installation, which embodies the use of plastic louvers between the luminous panels, is itself a "ceiling of light." There was no need to rebuild or to drop the ceiling. In the photograph above, the fixtures are suspended from the original ceiling using 18" stem hangers. (This attractive, easy to install and maintain lighting system is also ideal when it is necessary to cover an uneven ceiling, water pipes, beams, or discolorations.)

● **IMPROVED LIGHTING.** Customized louvered Smoot-Holman "Perfect Vision"® luminaires provide comfortable, shadowless illumination. A light level of approximately 150 foot candles is maintained in the office pictured. This installation made a marked improvement in light provided for typing and tasks performed in a vertical plane.

● **EASY TO MAINTAIN.** In contrast to most luminous ceilings, this installation has lamps at the ceiling line for easy cleaning and relamping.

● **BALLASTS LAST LONGER.** Ballast overheating had been a problem with the former surface mounted fixtures. These new suspended fixtures assure cool ballast operation.

● **PLEASING APPEARANCE.** The soft, even lighting — completely without glare — is pleasing to the eye and conducive to good work. The plastic louvers spaced between the "PV" lamp panels give unobtrusive relief from the monotony of a conventional type luminous ceiling.

● **CREDITS.** Mr. James Howard of the So. Calif. Edison Engineering Department, together with Don Rawlinson, lighting consultant in the Ontario office, planned the installation. In Mr. Howard's words, "Without having to rebuild the ceiling, we got improved lighting and a pleasing decorative appearance using customized louvered Perfect Vision® Luminaires."

Write for detailed information

SMOOT-HOLMAN Company
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Inglewood, California **RLM**



NUCLEAR SPECIALISTS at Northrop Norair Div., Hawthorne, Calif., monitor radiation level of fuel elements in a subcritical nuclear pile. Fuel elements are tubes containing uranyl sulfate in heavy water.

RADIOISOTOPES, profitable tool for western manufacturers

Only fraction of potential benefits have been realized by industry according to nuclear experts. Western industrial firms will do well to investigate this new field for possible cost saving methods.

TO POINT OUT use of radioisotopes as a profitable tool for Western industry in a wide spectrum of applications, nuclear specialists from government and industry met in a recent three-day workshop in Los Angeles and concluded that despite growth in applications only a fraction of potential benefits have been realized by industry.

Held under joint sponsorship of Western Gear Corp. and Northrop Corp., the meeting drew local specialists from firms such as American Machine

and Foundry, Shell Chemical, Lockheed Aircraft, US Rubber Co., and Associated Piping & Engineering Co.

Conferees were told by Paul C. Aebersold of the Atomic Energy Commission that use of radioisotopes was growing but limited technology and scarcity of trained engineers and technicians was a responsibility of management that to date was unfamiliar with economic values and high safety of radioisotope techniques. He said that only 226 industrial firms cur-

rently were licensed to use radioisotopes in California, the leading state in this respect.

He pointed to their use as tracer material in wear measurement, flow studies, process plant operation, leak detection, toxic gas warning, material analysis and all around troubleshooting that includes such common problems as location of pipe blockage and leaks in high pressure steam boilers.

A leading Western user of this material is the metals industry that is supplementing standard X-ray machines in nondestructive quality control of output to check for defects including porosity, cracks, voids, tears, shrinkage and inclusions (WI, July 1960, pp 21).

A representative of this industry, Frank Denson, Associated Piping & Engineering, described how their Torrance, Calif. plant installed safety equipment to insure against radiation hazard during inspection of weldments.

A system using portable shielding, movable by crane or hand, plant area markers with flashing red warning lights, and designation of safe areas for personnel working in the plant during isotope use went a long way to improve safety conditions and to quiet the suspicions of workers.

Denson explained that education of isotope technicians and plant workers in general seems to be the biggest hurdle in the program. A system of constant safety talks and reviews has been set up to indoctrinate employees.

Turning to other applications on the West coast, A. J. Brandel, California Research Corp., El Segundo, Calif. described how radioisotopes have been used

at El Segundo refinery of Standard Oil since 1953.

Use has been in flow rate measurement, leak detection and measurement, liquid and solid gaging and control. Flow measurement has been successful on liquid streams in partly filled pipes and in open channels.

He described how radioisotopes in tracer form have been valuable in locating leaks in refinery heat exchangers. Such detections are of great economic value, Brandel pointed out, since pinpointing of leakage can shorten or avoid a complete plant shutdown.

Tracers permit measurement of gas movement out of enclosed spaces and have been used to measure rate of vapor loss to evaluate their contribution to air pollution.

Radioactive sources are also valuable to locate plugged areas in exposed or buried pipelines. Sources are used frequently for locating pipe-fouling material such as catalyst, sediment, wax and sulfur deposits.

Two other basic ways in which radioisotopes may be effectively used were illustrated by Robert H. Johnson, Norair Div., Northrop Corp. The first involved efficiency of removal of cleaner from aluminum parts. During fabrication steps aluminum sheets were lubricated prior to stretch forming and then degreased with an alkaline, phosphate-containing cleaning agent.

The cleaner, in turn, was removed by warm water rinse. Next step was a protective surface treatment, either Anodizing or Iriditing. According to Johnson, parts under this procedure were being rejected by quality control in increasing numbers. The problem

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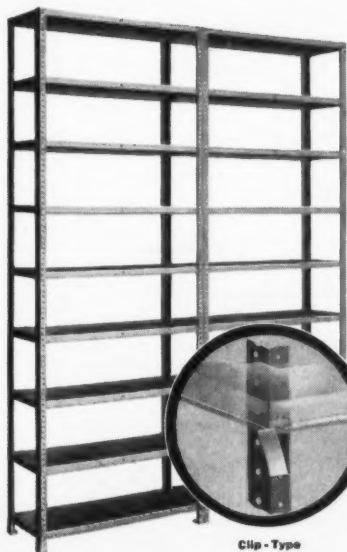
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CONFERENCE SPEAKER Robert Johnson, head of Norair Radioisotopes Laboratory, studies absorption properties of Chromium-51 on aluminum surfaces as part of program using radioisotopes to determine basic factors in metal bonding.

was thought to be insufficient removal of alkaline cleaner that was inhibiting the Anodizing or Iridizing process.

To check validity of this solution, Norair special-

ists tagged the alkaline cleaner with phosphate containing radioactive phosphorus-32. Panels cleaned in this solution were dropped into an agitated wash in 115 degree F. water for 5 minutes or a double dip rinse at the same temperature. A concentration of 0.5 microcurie of phosphorus-32 per milliliter of cleaner was measured before and after rinsing and showed that approximately 1% of the cleaner remained after the operation. Cleaner was ruled out as a prime cause of rejection and quickly freed probers to search for another cause.

In another case, Nortronics Div. was plagued with appearance of rust colored compound on precision lapped gears, despite their storage in closely controlled environmental conditions prior to final assembly.

Due to this careful handling, oxidation was ruled out, but it was felt that lapping compound was not completely removed after fabrication of the gear. Compound was tagged with specially prepared iron-55 and iron-59 isotopes. After lapping, the gear was cleaned with an organic solvent and checked for radioactivity by Geiger counter survey meter. Results were negative.

As a double check the gear was etched in a hot nitric acid solution which was condensed and counted. Measurable activity was observed and it was found that a maximum of 0.6 milligrams of lapping compound was left on the gear.

Result of the study led to replacement of the organic solvent rinse cycle with an ultrasonic cleaning system which solved the problem.

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Photo Courtesy Caterpillar Tractor Co., Peoria, Illinois

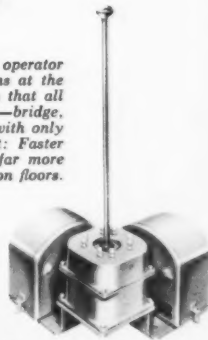
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P&H "joy stick" controller enables the operator to control both bridge and trolley motions at the same time with one hand. This means that all motions, in the desired direction of travel—bridge, trolley, and hoist — can be controlled with only one lever in each hand. Result: Faster control, with less operator fatigue, far more effective load spotting on busy production floors.

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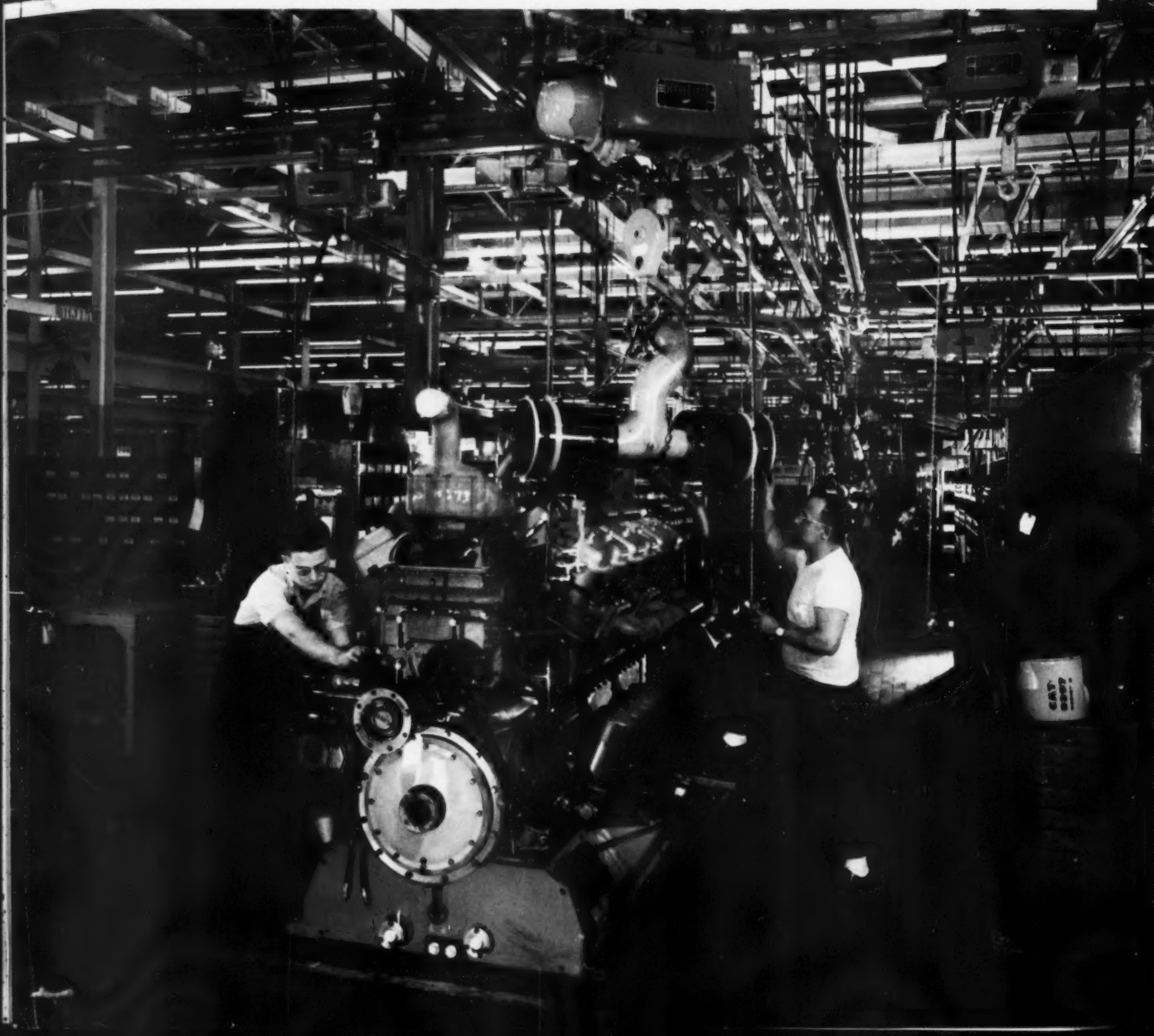
Where hoist performance can have no margin for failure, as on this assembly line, chances are you'll find

P&H hoists on the job. Every part — including electrical equipment — is built to P&H quality standards . . . standards that never heard of the word "compromise". Result: years of trouble-free performance for lowest actual lifetime costs of any hoist made today.

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Photo Courtesy Caterpillar Tractor Co., Peoria, Illinois





CLEANING CYCLE ENDS and part is pulled from tank. Six units may be cleaned at one time. Size of probe and number of holes for detergent flow varies with model of turbocharger. Dials, top center, register air pressure, detergent temperature and Ph characteristics.

CLEANING SYSTEM for close tolerance parts

Western company has developed this two unit system to efficiently flush dirt, chips and other matter from close tolerance turbocharger parts.

A TWO UNIT in-plant designed and fabricated cleaning system using hot phosphatized detergent and hot SAE 30 HD oil is successfully flushing dirt, chips and other matter from close tolerance turbocharger parts that operate at speeds up to 90,000 rpm.

Installed at Garrett Corp., AiResearch Industrial Div., Los Angeles, the system was developed from a simple cleaning tank operation first described in WI, March 1960, pp 39.

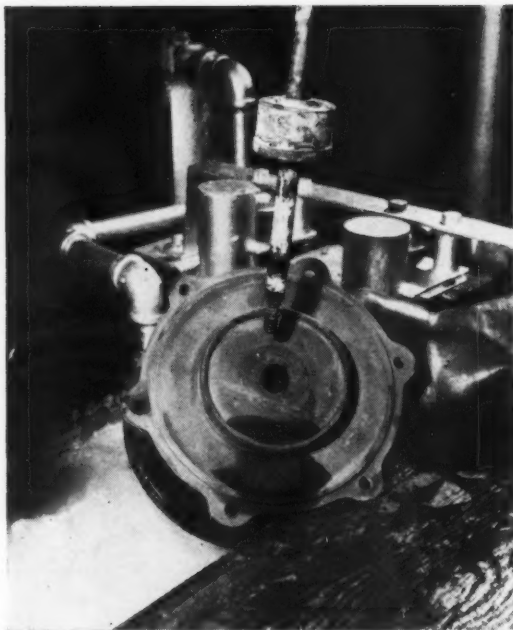
The detergent unit evolved from a metal sink fitted with air hoses attached to small bore copper tubing. Supplanting these on the new device is a series of metal probes having from 90 to 200 holes drilled at proper angles to inject a stream of hot

detergent down tiny oil passages.

Six of these probes are linked to an air pressurized system by Aeroquip hoses and Lunkenheimer lever valves. Air pressure is regulated by a Schrader air valve.

The cleaning stand itself is constructed on an angle iron framework and has water proof plywood drains. The tank where parts are immersed and the drain-boards are covered with alkali and heat resistant plastic.

Turbocharger housings are dropped into the liquid for a 6 minute pressurized bath applied to apertures by the probe in reverse direction to normal oil flow. Detergent courses through the part at 50 psi. and the 140 degree F. liquid not only forces particulate



CLEANING PROBE containing 90 holes, drilled at angles to inject detergent down tiny oil passages deep inside part, is inserted prior to immersion of the assembly in 140 degree F. solution.

matter from the passages, but degreases the housing and provides a phosphate coating that acts as a rust preventive until the paint line is reached. The cleaning solution is brought up to heat range by a Glo-Quartz immersion heater.

After painting, parts are put through a supplemental cleaning regimen designed to flush out particles that might have withstood the detergent action. This time flushing is accomplished with heated SAE 30 HD oil, typical to crankcases of engines on which the turbine may be installed.

The hot oil cycle is performed on an apparatus similar in size and design to the detergent unit. Oil is stored in tanks and forced through the part by a pump exerting 75 psi to move the oil heated to 180 degrees F. The oil bath lasts approximately 5 minutes.

Flushing is in the normal direction of flow. The part is clamped into an air tight fitting and is connected to a forked hose line that carries oil through the passages. Oil drains downward through the part and into a sump connected to a filter system that will take out particles down to 20 microns in size. Filtered oil is then pumped back into storage reservoirs for reuse. Thermal switches regulate oil temperature and prevent overheating.

The oil bath has the same effect as the run-in period on an engine and provides internal oil coating that will fight corrosion through final assembly and inventory periods.

AFTER ATTACHING hoses to turbocharger part, technician prepares to place it in air tight fixture. Part is held in place with clamp. Oil bath lasts for about 5 minutes.





CASTING MADE FORM 6061 aluminum is machined, drilled, and tapped under tape control using six tools per setup. Right hand piece on worktable is completed and will be replaced while other part is processed. Hole location tolerances are held to $\pm .001$ -in., repeatable to .0003-in.



JIG COSTS cut by tape-controlled drill

System permits use of simple workholding devices, eliminates costly fixturing.

LARGE WESTERN PLANTS AND SMALL JOB SHOPS alike are having to revise metalworking production techniques based on the concept of economic lot size relating to large output.

On the increase are orders calling for precision parts in lots of two dozen or under. One area of savings can be elimination of costly jigs and fixturing.

The Downey, Calif. division of North American Aviation has reported a 75% cost reduction through use of simple workholding devices and elimination of drill jigs and bushings on a wide assortment of work requiring drilling, tapping, and milling in lots sized at 25 parts or under.

Work is performed on a Burgmaster tape-controlled 6-spindle turret drilling unit. One application involves a two-piece assembly cast from 6061 aluminum. One piece is cast in 3 basic shapes and may require over a dozen hole patterns.

To avoid costs of design and building tooling for conventional drilling methods a low cost holding fixture is used of reach casting and a tape is made for each hole pattern. Tape preparation is rapid, about one minute to locate each hole location during programming. Tape can be punched at the rate of 4 holes per minute and when completed can be stored for repeated use.

Retained in the tape-controlled Burgmaster are standard controls including preselective spindle speeds, infinitely variable feeds, quick setting selective ap-

proach and return, accurate depth control and simple manual controls for the setup.

Feed and speed on each spindle automatically shifts as the turret indexes. The typical sequence of operation for two of the tapes is detailed below. Involved are 12 different drills, taps and end mills, and one complete tool change.

TAPE #1.

Spindle	Tool-Dia.	Speed-rpm	Depth	Holes
1	#2 C'Drill	3000		All
2	#1 C'Drill	2000		All
3	1/8 Drill	1000	3/16 thru	7
4	#43 Drill	3000	3/16 thru	2
5	#50 Drill	2000	3/16 thru	2
6	2-56 Tap	450	thru 3/16	2

TAPE #2.

1	#37 Drill	3000	3/16 thru	1
2	1/4 End Mill	2000	.922	2
3	4-40 Tap	450	thru 3/16	2
4	3/16 Drill	3000	3/16 thru	1
5	1/4 Drill	2000	3/16 thru	1
6	13/16 Drill	450	3/16 thru	1

Tape automatically positions the work for each hole with $\pm .001$ -in., repeatable to .0003-in. Two parts are on the machine at all times. A finished part is unloaded from the clamps and replaced while another part is being machined.



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CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, P. 76

BALL BEARINGS

Brochure covers a complete line of custom built, opposed angular contact double-row ball bearings. Contains detailed technical information on each type of bearing, including single row, radial and thrust, and double row. Illustrates both standard and special designs. *Hartford Steel Ball Co., Inc.*

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AIRCRAFT BOLT

Higher bolting strength for temperature applications up to 1200 degrees F is the subject of this technical bulletin. Details performance of the new external-wrenching bolt and complete mechanical properties are covered. Reviews significant aspects of design and processing and includes dimensional specification data. *Standard Pressed Steel Co.*

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ADHESIVES

U. S. Government specifications for a wide variety of adhesives, coatings and sealers are contained in this 54-page catalog. In numerical form the catalog lists military specifications, specification definitions, intended application and products that meet these specifications. *Minnesota Mining & Mfg. Co., Adhesives, Coatings and Sealers Div.*

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GEAR MOTOR

Brochure contains technical data, feature illustrations and descriptions of new line of right-angle worm gear motors. Shows specialized models including totally-enclosed, explosion-proof, flange-mounted, single phase and variable speed. Illustrates a number of optional mounting and assembly positions. *U. S. Electrical Motors, Inc.*

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SELECTOR VALVES

Bulletin explains how thermostatic selector valves, designed for specific application to year around air conditioning systems, eliminates the need for pneumatic lines or electrical connections. Specifications on both direct and remote actuator types are listed. *American-Standard Controls Div.*

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PRODUCTION PARTS

Bulletin illustrates and describes frequently used production parts in original equipment manufacture. The handy manual, prepared for the convenience of design engineers, contains specifications on such products as adapter couplings, bushings elbows, tees, hose assemblies and brackets. *Lincoln Engineering Co., Original Equipment Div.*

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VISCOMETER

Brochure is devoted to a practical and precise instrument for the measurement of flow properties, a viscometer. Explains principle of operation, accuracy, speed of use, ease of operation, reliability, ease of cleaning, portability, direct reading, wide ranges, flow properties and wide usage. Gives data on various models. *Brookfield Engineering Laboratories.*

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CASTINGS

Custom alloy steel castings for the process and manufacturing industries are covered in this booklet. Discusses company's engineering staff, metallurgical research and quality control, testing and inspection, freedom of casting design, shellcasting, static castings, heat treating and welding; tabulates corrosion resistant and heat resistant alloys. *Esco Corp.*

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HYDRAULIC POWER

This 68-page catalog covers a line of products which furnish power for oil-hydraulic systems, transmit power from those systems to the driven object, and exactly control that power. Explains the exclusive and outstanding features of these hydraulic system components. *American Brake Shoe Co., Denison Engineering Div.*

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INSULATION

Revised 64-page catalog contains six complete sections, each devoted to a specialized group of thermal insulations: high temperature; plumbing, heating and air conditioning; refrigeration; insulating fire brick; refractory products; finishes and weatherproofing materials; and miscellaneous insulations including asbestos paper and millboard. *Johns-Manville Corp.*

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SUB-FLOORING

Booklet about steel cellular sections for electrified sub-floor construction. Illustrates how the cellular beams in the structural sub-floor provide electrical raceways to serve every square foot of floor surface. Also discusses other uses for the cellular beams. Includes section property tables, load tables, and specifications. *R. C. Mahon Co.*

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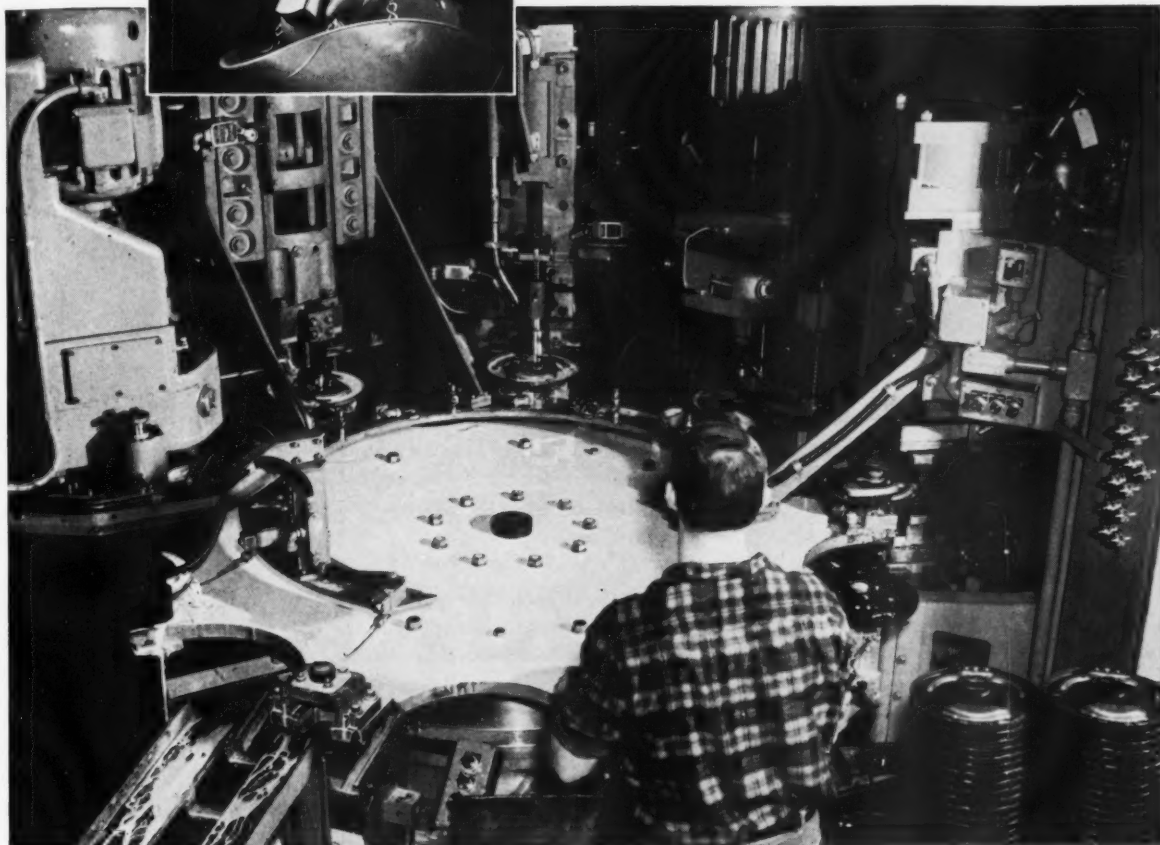
SPACE AGE MATERIALS

Materials for advanced technology is the subject of this booklet. Describes 12 new products from company's research and development division that offer important opportunities for improved design and performance in applications requiring resistance to abrasion, chemicals, corrosion, nuclear radiation and high temperatures. *Carborundum Co.*

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his ability to provide immediate repair parts and service—when and where they're needed. Wagner® motors have earned their reputation for proven dependability in their specific applications.

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Literature Advertised In This Issue

New Color Horizons system catalog and test sample of Damp-Proof Red Primer. *Rust-Oleum Corp.*
Pages 22 & 23 Circle No. 16

Hoist bulletin. *Harnischfeger Corp.*
Page 42 Circle No. 68

Overhead Cranes with precision control. Bulletin. *Harnischfeger Corp.*
Page 41 Circle No. 25

Combination Welding and cutting units. Bulletin. *Victor Equipment Co.*
Page 15 Circle No. 11

Special Fasteners for particular applications. Idea catalog. *John Hasall, Inc.*
Page 72 Circle No. 47

"T-1" Alloy Steel castings. Data bulletin. *Alloy Steel & Metals Co.*
Page 70 Circle No. 45

Air Vibrators for material moving. Descriptive literature. *Cleveland Vibrator Co.*
Page 74 Circle No. 50

Clip-Type Shelving for savings on erection costs. Catalog. *Columbia-Hallowell Div., SPS*
Page 49 Circle No. 27

Eye/Face-Wash for first aid until medical help arrives. Catalog. *Haws Drinking Faucet Co.*
Page 80 Circle No. 57

More Working capital through field warehousing. Booklet. *Haslett Field*

Warehousing.
Page 83

Circle No. 61

Paint Finishing Systems bulletin. *J. O. Ross Engineering.*
Page 9 Circle No. 6

Continuous Chain Conveyor bulletin. *Mathews Conveyor Co. West Coast.*
Page 53 Circle No. 30

How to Modernize and Expand plant structures. Descriptive literature. *Soule' Steel Co.*
Cover 4 Circle No. 67

Aluminum Holobar stock list. *Kilsby Tubesupply.*
Page 69 Circle No. 42

Carbon Steel Tubing and bars catalog. *Pacific Tube Co.*
Cover 3 Circle No. 66

Route Map of nation-wide thru trailer service. *Pacific Intermountain Express.*
Page 40 Circle No. 23

Caster and Wheel selection manual. *Darnell Corp., Ltd.*
Page 78 Circle No. 55

Electric Hoist and motorized pulley bulletin. *David Round & Son, Inc.*
Page 70 Circle No. 43

Pneumatic Hoist for use in hazardous atmosphere. Bulletin. *David Round & Son, Inc.*
Page 70 Circle No. 44

Industrial Gloves for more than 200 industries and trades catalogued.

Wicx-Merit Glove Co.
Page 86

Circle No. 62

Vital Statistics on truck tires. Bulletin. *Monarch Rubber Co.*
Page 55 Circle No. 31

Wire Cloth for screening, filtering, grading. Catalog. *Colorado Fuel & Iron Corp.*
Page 75 Circle No. 51

Formbrite Drawn Brass parts. Data bulletin. *Anaconda American Brass*
Page 6 Circle No. 4

Regulator that gives streamlined air control. Bulletin. *Perfecting Service.*
Page 76 Circle No. 52

Air Compressors for original equipment components, general shop or plant use. Specifications. *Kellogg-American.*
Page 16 Circle No. 12

Valves for every need. Catalog. *Wm. Powell Co.*
Page 5 Circle No. 3

Closed Circuit television catalog. *Motorola Communications.*
Page 87 Circle No. 63

Automatic Pallet loaders; package loaders. Literature. *Lamson Corp.*
Page 35 Circle No. 20

Industrial Material handling from A to Z, a booklet. *Frank G. Hough Co.*
Page 79 Circle No. 56

Storage Planning Guide. *Sturdi-Bilt.*
Page 80 Circle No. 58

CONVEYOR BELTS

A guide to the correct selection of conveyor belts for food and package handling applications is included in this brochure. Belts are rated on a selector chart for characteristics such as resistance to abrasion, high temperatures and oil and grease resistance. *B. F. Goodrich Co.*

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PIPE

Plastic pipe is the subject of this brochure. Contains table of properties, working pressure, flow chart, and other pertinent data for quick and easy evaluation of performance capabilities. Includes practices recommended for cutting, connecting, installing, testing, and backfilling. *Johns-Manville Corp.*

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2,000 LB. ELECTRIC FORK LIFT

Brochure about a newly introduced 2,000 lb. capacity all electric fork lift truck. Covers special features of Carbon Pile speed control and a super-heavy, electrically welded steel frame. Other advantages and specifications are also explained in the bulletin. *Lectro Lift.*

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TUBE REPLACEMENT

A new industrial tube replacement guide for electronic parts distributors contains complete listings for a wide variety of industrial tubes. Includes backward wave oscillators, counter tubes, gas switching tubes, klystrons, magnetrons, strobotrons, thyatron, trigger tubes and traveling wave tubes. *Sylvania Electric Products Inc.*

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THREADING MACHINE

Data about a new portable 2-in. pipe, conduit and bolt threading machine. Discusses seven major features including automatic double chuck and high usable production speed from powerful, long lasting, six brush motor. Lists specifications. *Col-lins Machinery Corp.*

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CASTERS

Compact catalog provides essential information about five standard series of casters that fulfill most industrial requirements. Includes helpful data for the selection of casters for a wide variety of applications. Presents tabular data on wheel diameter and face, rate capacity and bolt hole spacing. *Rapids-Standard Co., Inc.*

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SMOG REDUCER

Data about an accessory for installing in all internal combustion engines that reduces smog producing elements from exhaust. Illustrates and explains operation of the device as well as installation instructions. *Pioneers, Inc.*

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HEATING

Electric comfort heating equipment is treated in complete and concise fashion in this new catalog. Valuable application and production information is included for solving industrial comfort heating problems. Gives dimensions, engineering and application data on each equipment item, also illustrations. *Edwin L. Wiegand Co.*

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QUICK DISCONNECTS

A miniature coupling with automatic locking and designed for instrumentation is the subject of this bulletin. Describes three different types of end connections available: for pipe, Tygon, and rubber hose; plastic tubing; and for copper, brass, and other metal tubing. Complete details and engineering data. *Perfecting Service Co.*

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MACHINING PLASTICS

Reprints of a technical article on ways to machine laminated plastics describes specific fabrication methods for standard laminates and for recently-introduced grades. Methods described are: sawing, punching, drilling, tapping, planing and shaping, gear cutting, lathe and screw machining, milling, finishing, marking, reaming and shearing. *National Vulcanized Fibre Co.*

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METAL CUTTING

A comprehensive job portfolio illustrating, complete with all technical details, efficient metal cutting jobs run on multi-spindle automatics. Prepared for production men who are looking for better machining methods in the small lot field, booklet contains a wealth of information on dozens of different workpieces and tooling applications. *Warner & Swasey Co.*

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DATA PROCESSING

Booklet describes in non-technical language the features of an electronic data processing system including its data link system: high speed printer and magnetic drum storage. Illustrates all major parts of the system. *Philco Corp., Computer Div.*

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FORKLIFT LP-GAS KITS

Brochure describes tailored LP-Gas conversion kits for forklift and industrial trucks. Covers line of kits designed to exact truck specifications, and featuring a positive pressure fuel system. Outlines features of the system and advantages of using LP-Gas in forklifts. *American Liquid Gas Corp.*

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WELDING STAINLESS

Information concerning techniques for welding stainless steel is contained in this booklet. Gives physical properties, structure, and welding characteristics of the different types of stainless steel. Includes chart listing deposit properties and electrode recommendation tables for the different types of stainless steel. *Lincoln Electric Co.*

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THERMOMETERS

Catalog illustrates and describes line of bi-metal actuated dial thermometers designed for use by all plant operating personnel. Shows each thermometer individually with construction features, sizes, stem lengths, dimensions, weights, and general specifications. Also covers thermometer wells and adapter sets designed for use with them. *Manning, Maxwell & Moore, Inc.*

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SAFETY

Catalog of safety bulletins, signs, stickers, posters and folders that are available without charge for use in factories, warehouses and other industrial establishments. Booklet contains reproductions of attractive posters and signs to provide the necessary ammunition to launch a battle against injuries, lost production time and needless suffering. *Argonaut Insurance Co.*

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TOOLS...LET REPUBLIC SUPPLY YOU!

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TEMPERING

Bulletin describes furnaces used for atmosphere tempering, annealing, and stress relieving. Contains illustrations and cross section of atmosphere tempering unit. Covers special features, specifications of dimensions, maximum heat input, and net heating rate. *Ipsen Industries, Inc.*

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ACID CLEANING

Booklet gives newly developed scale dissolution rates for sulfamic acid cleaners, plus a diagram sheet showing simple equipment cleaning hookups. Discusses use of sulfamic acid cleaners for in-place descaling of industrial equipment and advantages of its use. *E. I. Du Pont de Nemours & Co., Inc.*

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COATING

Data about a new green aluminum coating for industrial applications. Discusses its use as a top coat for use on tanks, structural steel, metal sash, piping, wire fences, metal roofs and buildings. Outlines advantageous features of the coating, application and other pertinent data. *Rust-Oleum Corp.*

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VACUUM FURNACES

Illustrated booklet is devoted to a line of vacuum furnaces. Contents cover vacuum metallurgy; arc melting furnaces of the laboratory and production types; induction heated furnaces for melting and casting and for sintering and heat treating; resistance heated furnaces of the indirect and the direct heated types. *Consolidated Vacuum Corp.*

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MANUAL STARTER

Booklet about a new manual starter that has been developed for use with fractional hp motors. Also illustrates and describes enclosure types, special features, applications and construction. Gives full dimensional data on new Class 10 starter that provides manual, across-the-line, start-stop or on-off control of fractional one hp single phase electric motors. *Furnas Electric Co.*

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PLASTICS

Table shows significant physical, electrical, chemical and optical properties of nine thermoplastic materials: acrylics, acetate, butyrate, Teflon and Kel-F. fluorocarbons, nylon, polyethylene and vinyls. Data is compiled from test reports from manufacturers. *Cadillac Plastic & Chemical Co.*

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GAUGES

An 84-page idea book pictures many ingenious gauge modifications of interest to inspection engineers. Booklet shows how standard components can be incorporated in special and unusual gauging assemblies. Simple solutions to many common gauging problems are shown. *Boice Gages, Inc.*

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TOOLS

Descriptions and dimensional data on a line of standard and special tools is contained in this 35-page illustrated catalog. Covers gun drills, boring tools and holders, pipe reamers, contour cutters, flat form tools for standard hydraulic fittings, end mills, routers, milling cutters and hollow mills. *Wetmore Tool and Engineering Co.*

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ABRASIVES

Catalog of national standard abrasive belts, rolls, sheets and discs lists standard coated abrasive products throughout the industry. The 50-page manual also contains a listing of the basic elements of coated abrasives and general uses for coated abrasives in metalworking, woodworking, leather work and miscellaneous. *Carborundum Co.*

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FILTERS

Bulletin describes filters for converting regular factory compressed air, to air so pure it is usable for operating pneumatic precision instruments. Air regulators and air accessories are included. Also describes new dehydrator equipment for lowering the dew point of compressed air to ultra-low Fahrenheits, and for extreme removal of oil traces. *Wilkinson Corp.*

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AIR POWERED CONVEYING

Booklet tells about an open conveyor which moves solid materials unlimited distances, even uphill, using air as the working media. Explains principle of operation and discusses applications from conveying sawdust to two-by-four dimension lumber. *Engineers Associated.*

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VIBRATORY FEEDERS

This 46-page catalog is devoted to a line of electromagnetic vibratory feeders. Contains complete descriptions, data and specifications, along with over 100 illustrations of small, heavy and extra-heavy duty feeders. Also features spreader feeders and heat-resistant furnace feeders. *Syntron Co.*

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PIPE, TUBING MEASUREMENT

Booklet tells how to measure and relate pipe, tubing and hose sizes. Supplies standard methods of measurements, discussing both the similarities and the differences involved in measuring various fittings and fluid-carrying lines in order to arrive at satisfactory fluid line installations. *Aeroquip Corp.*

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MOLD RELEASE COMPOUNDS

Silicone mold release agents for the metal working industries is subject of new publication which lists the desirable properties of silicone release emulsions, fluids and compounds. Includes data to help in the selection of the proper silicone release agent, and suggests techniques for using silicone release agents. *General Electric, Silicone Products Dept.*

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AUTOMATIC BATCHING

Booklet describes an automatic batching control system especially designed for concrete and asphalt proportioning. Explains utilization of "load cells" to weigh out pre-set amounts of material feeding into weigh hoppers. Covers flexibility in use of either full electronic system or connecting to a mechanical lever. *Electronics Div., Fairbanks, Morse & Co.*

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DIE ALLOY

A hard bronze die alloy for drawing, forming or bending operations is the subject of this bulletin. Explains advantages of the alloy in greater toughness, improved part resistance, machinability and greater resistance to wear and abrasion. Lists typical die applications. *Ampco Metal, Inc.*

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DOOR INTERLOCK SWITCHES

Bulletin covers eight standard door interlock switches for cabinets, consoles and other enclosures containing electronic equipment hazardous to personnel. Includes photos, mounting dimension drawings, mechanical characteristics and electrical ratings. *Micro Switch Div., Minneapolis-Honeywell Regulator Co.*

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TUBING APPLICATIONS

Round and square welded steel tubing applications are listed in this brochure. Discusses tolerances permissible in bending, swaging, flanging or punching welded tubing in the fabrication of products. Outlines tolerances of tubing with respect to size, flash, ovality and straightness, and cutting and deburring length limits are defined. *Epps Industries, Inc.*

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PINCH VALVES

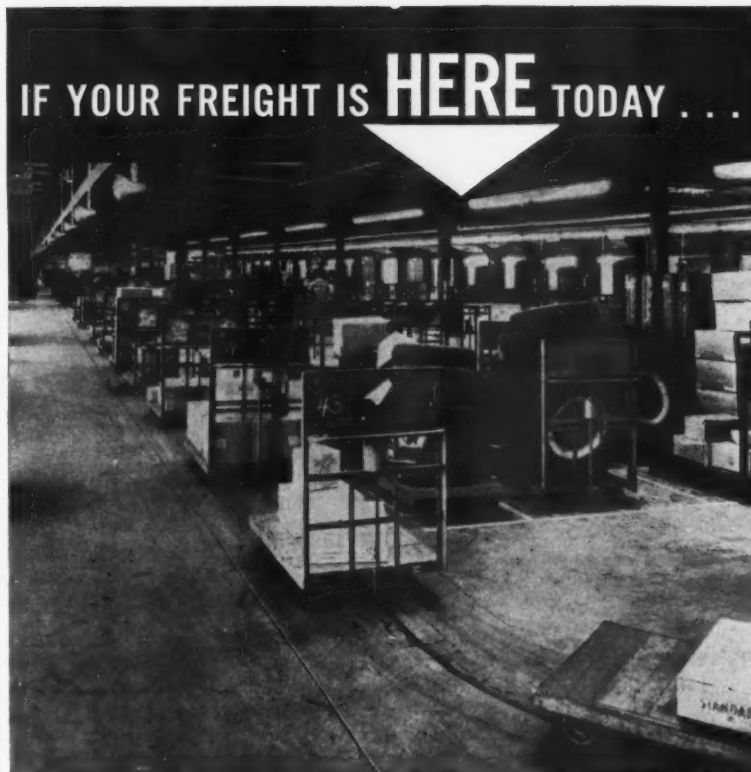
A new system for automatic opening and closing of pinch valves is described in this bulletin. Discusses important advantages of the system including the flexibility of the controlled circuitry to meet any operating requirements. Outlines construction features and describes manual, motorized and hydraulic closing mechanisms. *Mine and Smelter Supply Co., Manufacturing Div.*

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LIQUID BLENDING

A line of proportioners and new concepts in continuous line blending are detailed in this bulletin. Discusses advantages of line blending over batch blending and explains the operating principle of the Vari-Flo units. A schematic layout is used to describe the purpose and function of various secondary components from which packaged systems are engineered to meet specific job requirements. *Blackmer Pump Co.*

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Photo, Courtesy of Lyons Transportation Company

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SPECIAL MANUALS

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PORTABLE POWER TOOLS

THIS MONTH the editors of WESTERN INDUSTRY have put together a comprehensive listing of manuals on portable power tools. It is no accident that this subject was chosen, for these items represent a type of production and maintenance tool particularly suitable for Western manufacturing plants. Portable power tools are inexpensive and in many instances can increase production substantially at a very low cost. With the West's limited to moderate production schedules flexibility is needed. Portable power tools are inherently flexible. They are available for a multitude of services: drilling, grinding, screwdriving, nut running, riveting, sawing, hammering, nailing, welding, etc. In almost every Western plant there is an application now being done by hand where a power tool can be used to cut costs. This is another one of those areas in production, in which intelligent investigation will often uncover situations where an extremely small investment can result in surprising savings.

Portable power tools like many other items of plant equipment have undergone steady improvement. You will find the new power tools lighter, more powerful, and easier to use. Some of them, such as the power nailers and screw drivers are automatic in that they set up the nail or screw in work position ready for action. Portable power tools are more diversified than ever before. Though most of them are powered by electricity, you will find those that are powered by air, hydraulically or by gasoline engine. Each type has its special field of applications. Example is new portable air-powered saw for safe use in any atmospheric condition such as underwater.

Whatever your need is it is likely that there is a portable power tool to fit that need. The editors of WESTERN INDUSTRY suggest that you examine this field of portable power tools carefully. These tools can solve many problems in manufacturing and maintenance encountered by Western Manufacturers.

Air-powered Wire Clippers

Publication describes newly developed Air-Nips, an air-powered wire clipper. Also illustrates the convenient portable power supply that eliminates the need for a new air source for the Air-Nip. *Chicago Pneumatic Tool Co.*

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Power Assembly Tools

Data book describes the development of the threaded fastener and a line of screw drivers, nut runners and impact wrenches to drive threaded fasteners in all types of assembly operations. Booklet is used as a text in many vocational schools and industrial plants. *Black & Decker Mfg. Co.*

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Diamond Drilling Equipment

Bulletin devoted to a line of diamond drilling equipment. Includes general description and specifications. Also contains data about available accessories. *Milwaukee Electric Tool Corp.*

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Drill for Limited Access Area

A power tool that can drill holes within 1/4-in. of bulkheads and other obstructions and within 9/32 in. radius in 90 degree corners is the subject of this bulletin. Includes specifications, dimensions and engineering data. *Winslow Product Engineering Corp.*

... FOR YOUR COPY, CIRCLE NO. 203

2 hp Portable Grinder

Data about a 2 hp portable grinder for tough snagging and heavy-duty industrial operations. Outlines construction features of the grinder, performance and includes specifications. *Vee-Arc Corp.*

... FOR YOUR COPY, CIRCLE NO. 204

Impact Tools With Quick Change Torque Control

Bulletin about new torque control impact tools that feature detachable torsion bars to increase the speed and accuracy of driving nuts, bolts and cap screws to a variety of precise torques. Includes application photos and complete specifications. *Ingersoll-Rand.*

... FOR YOUR COPY, CIRCLE NO. 205

Precision Machining at 300,000 rpm

A new industrial tool for ultra high speed removal of metal and other materials to precision tolerances is described in this bulletin. Discusses machining extremely hard materials such as ceramics, glass, carbides, and hard metals with diamond and carbide tools at greatly improved efficiency. *Ashcombe Co.*

... FOR YOUR COPY, CIRCLE NO. 206

Sabre Jig Saw, Sanders and Drills

A portable sabre jig saw that combines all the features of a rip, crosscut, band, keyhole, hack, jig and scroll saw to cut through two-inch dressed lumber is described in this bulletin covering a line of portable electric tools. The saw also cuts plywood, plastics, leather and even metal with the proper blade. *Cummins, Div. of John Oster Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 207

Angle Screw Driver

Data about an angle screw driver designed for close quarter performance. Discusses features of the heavy service $\frac{3}{8}$ -in. capacity tool, performance, attachments to fit varied applications and specifications. *Gardner-Denver Co.*

... FOR YOUR COPY, CIRCLE NO. 208

Air Grinders

A portable air grinder particularly adaptable to applications for coated abrasive products such as cartridge rolls, spirals and bands is described in this bulletin. Includes application photos of the general purpose tool, specifications and other pertinent data. *Field Abrasive Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 209

Portable Electric Tools

Bulletin covers a line of portable electric tools. Describes a combination polisher sander drill with a spindle locking device which enables the quick removal of the chuck when changing from drilling to sanding. Also describes a portable electric heat gun which features instantaneous heat without the danger of an open flame. *United States Electrical Tool Co.*

... FOR YOUR COPY, CIRCLE NO. 210

Routers, Positive Feed Drills and Trim Shears

Router models described in this 50-page manual fall into two main classifications, hand operated and guided or fixture mounted for accurate routing of heavier gauge metals. A third type is a completely automatic self-feeding router for large circumferential cutting or chamfer jobs. Outlines design features of a line of portable positive feed drilling units and covers three basic models of trim shears. *A. B. Quackenbush Co.*

... FOR YOUR COPY, CIRCLE NO. 211



Differences between one solid tire and another go far beyond the considerations of price and delivery. Check these vital statistics against the operating conditions in your plant.

FACT NO. 1 Rim separation is the most common cause of truck tire failure.

FACT NO. 2 Rim separation is caused by truck operation over chips, turnings and borings... through brine and acid solutions... over rough surfaces... frequent overloaded conditions... and in areas of excessive heat.

FACT NO. 3 MONARCH'S MONOLOK tires will guarantee you the best possible protection against these hazards.

FACT NO. 4 MONARCH'S MONOLOK PROCESS will increase tire life as much as 250% and reduce truck down-time as much as 70%.



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POWER TOOL MANUALS

(Continued from page 55)

Portable Electric Tools

New catalog illustrates and describes full line of portable electric tools complete with specifications and other pertinent data. Includes heavy-duty drills, circular saws, chain saws, shears, sanders, grinders, generators, hammers, nut runners, polishers, diamond core drilling equipment and a complete line of accessories. *Milwaukee Electric Tool Corp.*

... FOR YOUR COPY, CIRCLE NO. 212

Plastic Cutting Handtool

Data about a plastic shear that is portable, lightweight and simple to operate. Lists applications which include all synthetic resin materials and laminated plastic sheeting. *L. E. Birbach Associates, Inc.*

... FOR YOUR COPY, CIRCLE NO. 213

Grinder Miller

Catalog includes description of a high speed portable powertool capable of both efficient grinding and rapid milling. Discusses outstanding features of the grinder-miller, design, applications and specifications. *Precise Products Corp.*

... FOR YOUR COPY, CIRCLE NO. 214

Drills, Sanders

Booklet opens with a description of the outstanding feature of line of power tools, the motor. Covers drills and sanders, including specifications for the various models, accessories available and applications. *American Lincoln Corp.*

... FOR YOUR COPY, CIRCLE NO. 215

Versatile Abrasive Belt Unit

An abrasive belt unit for almost every type of belt grinding and polishing within the capacity of its 2½ in. belt and 2 hp motor is the subject of this bulletin. Photos show a number of simple and ingenious uses for this abrasive belt unit. *Grinding and Polishing Machinery Corp.*

... FOR YOUR COPY, CIRCLE NO. 216

Tools for Building, Woodworking, Maintenance

A line of portable tools for building, woodworking and maintenance jobs is presented in this 40-page catalog. Each product is illustrated and described along with an application photo. Included are saws, belt sanders, paint remover, rust chipper, drills, grinders, routers, planes, and attachments. *Porter-Cable Machine Co.*

... FOR YOUR COPY, CIRCLE NO. 217

Six-in-One Electric Arc Gun

Bulletin describes the various applications, construction and design features and other details pertinent to a newly developed electric air gun. The portable tool serves as a spot welder, stud welder, tack welder, button welder, hole burner and riveter. *Beeco Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 218

Sander

Data about a straight line action sander with a removable knob which adapts the sander for either left or right hand operation and allows free access into corners. *Weller Electric Corp.*

... FOR YOUR COPY, CIRCLE NO. 219

Electric and Air Tools

This 72-page catalog is devoted to a line of portable electric and air tools. Pages one through forty cover industrial tools including impact wrenches, drills, nut runners, grinders, sanders, saws and attachments. Illustrations and specifications. *Albertson & Co., Inc.*

... FOR YOUR COPY, CIRCLE NO. 220

High Frequency Electric Tools

Catalog opens with an analysis of high frequency tools and a capsulized report on the advantages of using 180, 360 or 400 cycle tools for specific job applications. Gives data on line of grinders, sanders, polishers, impact wrenches, screwdrivers, nutsetters, drills, reamers, and balancers. *Thor Power Tool Co.*

... FOR YOUR COPY, CIRCLE NO. 221

Straight Air Grinders

Milling narrow slots, burring slots, grinding dies, hole grinding, tool post grinding and cleaning up castings are among the applications illustrated for this straight air grinding tool. Includes specifications for 14 models of the tool in two series, also application data for the various models. *Doeden Tool Corp.*

... FOR YOUR COPY, CIRCLE NO. 222

Electric Hammers

Manual describes construction, features and multiple uses of a line of electric hammers, including drilling in concrete, stone and brick; caulking joints and seams; pointing masonry and brick; chipping rust, scale and spatter, gouging and shaping timbers; tamping and vibrating; channeling; demolition and other hammering operations. *Black & Decker Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 223

Heat Drilling, Fastening, Abrasive and Special Tools

Complete line of portable air-powered and electric tools are set forth in this 72-page catalog. Sections of the catalog deal with heat drilling, fastening, abrasive and special tools such as saws and routers, also electric tools and accessories. *Buckeye Tools Corp.*

... FOR YOUR COPY, CIRCLE NO. 224

Nail Drivers

Data about a line of air-operated nail drivers that can handle six penny to 60 penny nails. Outlines features of speed and safety. Includes specifications for five models listing the minimum and maximum nail size for each model. *Chicago Pneumatic Tool Co.*

... FOR YOUR COPY, CIRCLE NO. 225

Air Tools and Accessories

Catalog contains eleven sections, each devoted to the power tools that make up the company's complete line, with the final two sections covering accessories and maintenance. Included in the line are drills, screwdrivers and nutrunners; impact wrenches; grinders and sanders; chippers and scalers; riveters; sand rammers; construction tools, and custom-built assembly equipment. *Cleco Air Tools.*

... FOR YOUR COPY, CIRCLE NO. 226

Power Tool Catalog

Newly revised 92-page catalog of complete line of industrial power tools and accessories. Includes specifications, listings and descriptions of accessories for all tools; action photos and drawings supplement the text. Describes new tools designed to broaden production-line applications. *Rockwell Mfg. Co., Delta Power Tool Div.*

... FOR YOUR COPY, CIRCLE NO. 227

Automatic Nailers, Screwdrivers, Tackers

Various models of automatic nailers and tackers designed for a wide range of fastening applications are described in this booklet. Charts specifications and illustrates three single blow machines and three repetitive blow nailers. Also describes and illustrates an automatic screwdriver which can handle up to 26 different sizes, types, without fitting change. *United Shoe Machinery Corp.*

... FOR YOUR COPY, CIRCLE NO. 228

Air Tools

This 27-page catalog opens with a discussion of the basic principles of air tools. Includes illustrations and complete data on midjet collet die grinders, small wheel die grinders, small wheel grinders and large wheel grinders, sanders-polishers, circular air saws, drills, reversible and non-reversible screwdrivers, impact wrenches and chain saws. *Remington Arms Co., Inc.*

... FOR YOUR COPY, CIRCLE NO. 229

Air Turbine Portable Routers

Portable routers for use on wood, plastics and non-ferrous metal are described in this bulletin. Outlines advantages of using the air turbine motor, models available, and attachments. *Onsrud Machine Works, Inc.*

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NEW EQUIPMENT

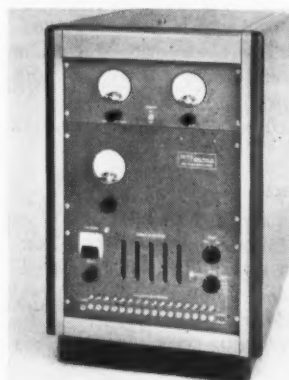
FOR WESTERN PLANT OPERATION, PRODUCTION AND MAINTENANCE



USE RIP OUT POSTCARD, PAGE 76, FOR MORE INFORMATION ON PRODUCTS DESCRIBED

DUST MONITOR

... instrument tells how clean air is



By the addition of an air dilution system to its Model PC200A Airborne-Particle Monitor, an instrument is provided capable of accurately describing the spectrum of particles present in specimens of air ranging from clean-room atmospheres to the most polluted industrial smogs. In

addition, the dilution system, available by itself, can be used in the laboratory to give an accurate means of mixing air or gases in controllable proportions. Used with the Airborne-Particle Monitor, the new dilution system mounts in a standard 19-in. rack or in a metal cabinet 24 in. wide by 30 in. deep by 38 in. high, the individual panel being 7 in. by 19 in. The dilution system provides a continuously variable addition of filtered dilution air from 0 to 200 cc per minute to a basic sample, giving dilution ratios from zero to 50:1. Its design is such that it can be cut in or out instantaneously, making it very flexible in use. All the basic facilities of the PC200A are usable with or without the modifying effect of the dilution system. Fifteen sub-ranges of particle sizes from 0.32 to 8 microns can be examined and individually indicated on decade registers and recorded by galvanometer, potentiometer, or digital printer. Particle concentrations to 7340 per minute can be counted with the normal 100-cc-per-minute sample input. Manual selection or automatic scanning of particle-size ranges can be chosen and in the programmed mode of operation, the instrument allows for 0.3, 1, 3, or 10 minutes of monitoring at each range. *Royco Instruments Inc.*

... FOR MORE DETAILS, CIRCLE NO. 300

CERAMIC FIBER

... developed for high temperature insulation

Fiberfax ceramic fiber, a high temperature insulation under development for several years, has been made a standard product. A mix of high grade alumina and silica sand is heated to 3900°F and poured in a molten stream the size of a lead pencil. The stream is struck

with a blast of air or spun into fibers of varying lengths that look very much like white wool. The fibers are fabricated into over 40 forms such as blocks, sheets, paper, textiles, blankets, rope, castables and molded forms. The light durable material withstands continuous operating temperatures up to 2300° F. Application areas range from standard furnace insulations to very complex heat shields for space age components. Uses include combustion chamber linings for oil and gas fired furnaces, components for processing molten aluminum, industrial heat treating and brazing furnaces, high temperature gaskets and packing, missile and rocket applications and high temperature gas filtration. *Carborundum Co.*

... FOR MORE DETAILS, CIRCLE NO. 301

TRASH COLLECTOR

... new unit handles 120 cu. yds.



The development of a new self-loading packer to collect refuse from existing Dempster-Dumpster containers has been announced. Industrial plants may now convert their existing container systems to on-the-spot collection

service to eliminate long hauls to disposal areas with individual containers. Kits for the conversion of old containers to the new system, together with complete instructions and working drawings are now available from the manufacturer. These kits consist of new lids and container handling side channels which can be easily and quickly welded into place. The new collector has been designated the Super Dempster-Dumpmaster. It consists of a pair of powerful truck-mounted clearance arms which empty the containers into the hopper opening of a 30 cu. yd. compaction body, where the material is reduced to a fraction of its former volume by action of the 85,000 lb. thrust developed by the hydraulic packer plate. Depending upon the character and density of the material, the new packer can haul up to the equivalent of 120 cu. yds. of refuse on every trip to the disposal area. In addition to handling converted containers up to 12 cu. yd. capacity, the new unit also handles newer Dumpmaster containers from one to 10 cu. yd. capacity. *Dempster Brothers, Inc.*

... FOR MORE DETAILS, CIRCLE NO. 302



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nation's top-quality electrical control equipment**

Soon you will see this new trademark on Clark control devices and systems.

Behind this symbol are the precise engineering and exacting production methods which make possible the high standards of quality for which Clark is famed. Behind it are men with the know-how to create the longest lived, sturdiest, most efficient electrical controls. Behind it are answers to your needs for everything from standard equipment such as motor starters, relays and push buttons to complete engineered systems.

For help in solving your control problems, contact your local Clark distributor or district

sales office, or write direct. *The Clark Controller Company* • Main Plant: Cleveland 10, Ohio—Western Plant: Los Angeles 58, California—In Canada: Canadian Controllers, Limited, Toronto, Ontario.

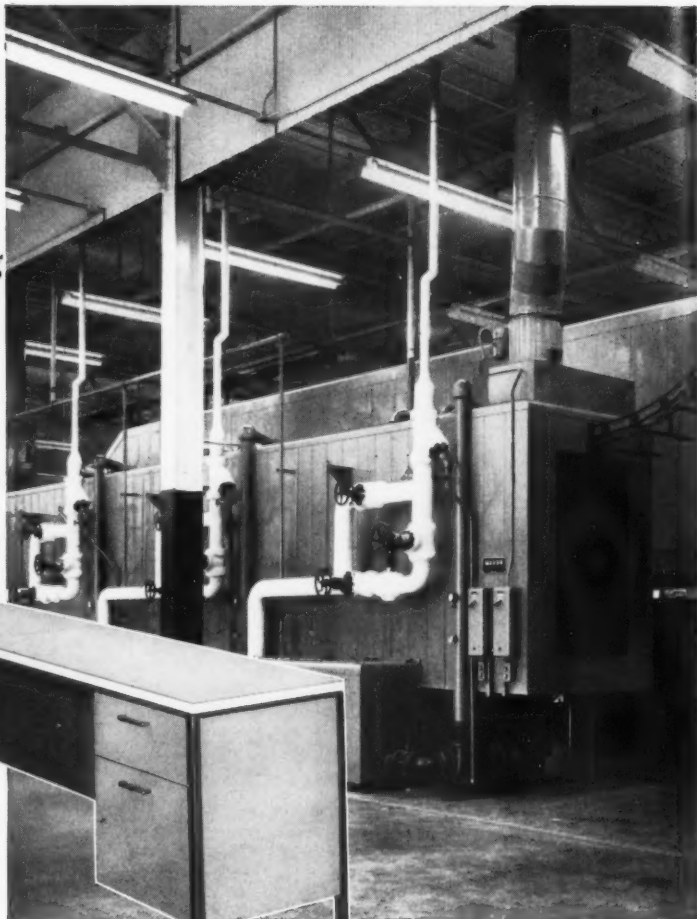
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—*Los Angeles Division:* A modern manufacturing plant and warehouse with complete sales, engineering and service facilities—4755 East 49th Street; *San Francisco Warehouse and Sales Office:* Complete stock of motor control apparatus available for quick delivery—1770 Yosemite Avenue; *Sales Offices* also in Albuquerque, Denver, Phoenix, Portland, Salt Lake City and Seattle.

Quality metal products deserve "the finishing touch" of Mahon

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furniture
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General Fireproofing**

below: one of GF's new 1000 Series desks, part of a striking, new functionally designed business furniture line. At right: a stage of the complete finishing system designed and built by Mahon for GF's San Luis Obispo, Calif. plant.



Production finishing is the application of coatings of a specified quality at highest efficiency. That also sums up the business of Mahon's Industrial Equipment Division and they have learned it well . . . for over forty years . . . in hundreds of installations . . . for all types of finishing. Mahon metal-cleaning and metal-finishing systems will prove your best investment regardless of initial cost. In this highly specialized, multi-process area, can you afford less than the best for your quality products? Find out how Mahon's 'finishing touch' can improve your products . . . your costs . . . your sales. Call in Mahon.

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WESTERN INDUSTRY/APRIL 1961

POWER DRIVE

... designed for short screw conveyors

A compact screw conveyor drive has been especially designed for short conveyor flights and low horsepower requirements. The new unit consists of a double-reduction speed reducer with packing gland and driving shaft which mounts on a trough end. Trough ends are also available. Maximum efficiency is assured through the use of heat treated helical steel gears and pinions, all rated according to standards of the American Gear Manufacturers Association.

The new drives are designed to triple-seal the reducer unit against invasion by the materials being conveyed. The packing gland is adjustable from the outside, takes standard packing, and may be inspected by sight. Slotted holes in the flange of the reducer permit the unit to be rotated for quick and easy adjustment of V-belt drive center distances. Heavy-duty tapered roller bearings in the reducer take thrust from the screw in either direction. Driving shaft is mounted in a steel sleeve, and built-in puller facilitates changing the shaft without opening the reducer. Entire drive is easily mounted or removed from trough end with three bolts in the reducer flange. *Dodge Mfg. Corp.*

... FOR MORE DETAILS, CIRCLE NO. 303

HAND MAGNET

... can solve many handling problems



A new manually-operated magnetic unit for handling small or large metal parts has been announced. The unit can also be used for feeding round, square, or irregularly-shaped sheets into presses, shears and similar production equipment. Ideal for small parts

packing, sorting, and weighing operations, the hand magnet picks up and securely holds a quantity of loose nuts, bolts, screws or other light metal objects. A squeeze on the plunger-like handle instantly releases the parts. Heavier items such as blocks, dies, rods, etc., are handled with facility and a positive grip is assured even on wet, greasy, sharp, or hot metal objects. The device also effectively separates stacked metal sheets and is adjustable to accommodate various weights and thicknesses. The magnet literally "floats" sheets in air, permitting machine operator to quickly grasp individual pieces. Pry marks and scratches on parts are eliminated, and hazard of injury to workers is reduced. Optional stainless steel strips offer extra protection against wear. Two compact models are available: a light unit which handles up to 3 lbs. of loose parts, or larger pieces to 30 lbs.; a heavy-duty unit with 5 lb. and 50 lb. capacities. For sheet separation, the two units will handle maximum thicknesses of 16 and 11 gauge. A stainless steel, tamper-proof case seals out dust, dirt and other foreign matter. *Magnetic Products Div., Jess Corp.*

... FOR MORE DETAILS, CIRCLE NO. 304

STORAGE CABINETS

... designed to be tamper-proof



to the all-welded door frame to insure accurate "tamper-proof" fit and fast field erection. Positive three point locking at top, center and bottom assures even door closure and eliminates door flap. Door hinges are the semi-concealed full loop type of strong five knuckle construction, and the locking handles feature built-in grooved key cylinder locks which can be master-keyed. For additional security, more than 200 key changes per lock can be made. The shelf support strips are designed to be an integral part of the cabinet, by-passing auxiliary support clips that can be lost or misplaced. Shelves in all three models adjust easily and quickly in 2 in. increments up or down. Their compound channel construction adds strength, and an extra return flange at the front of each shelf does away with the sharp edges found in some cabinets. All three models of the series measure 36 in. wide x 78 in. high x 18 or 24 in. deep. Model 815 is a double door storage cabinet with four shelves capable of storing up to 36 cubic feet of materials. Model 835 is a double door wardrobe cabinet which holds 12 to 16 heavy coats. Model 855 is a combination wardrobe and general storage cabinet with a full-width hat shelf and half-width hanger rod. *Columbia-Hallowell Div. SPS Co.*

... FOR MORE DETAILS, CIRCLE NO. 305

LIFT TRUCK

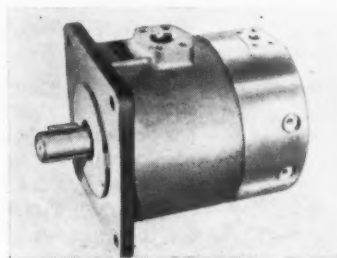
... is gas powered stand-up type

A new gas powered stand-up end control lift truck has been added to the line of materials handling equipment. Called the "Stand-Up," the new truck is available in two models, the C20-SU and the C25-SU, rated at 2000 and 2500 lbs capacity at 24-in. load centers. It is designed for use at truck terminals, warehouses, truck and rail docks and at other operations where the driver is required to get off the truck frequently to pick orders, inspect labels and assemble lot loads. The new lift truck embodies design features never before available on a gas powered end control stand-up machine, including water-cooled engine, power shifted transmissions with torque converter, and swing-out panels for easy engine accessibility. Both models are powered by a four-cylinder, L-head engine of 112 cu. in. displacement. The Hydrotork Drive® power shifted transmission provides a power train which permits a maximum travel speed of 8 mph forward or reverse with rated load. The C20-SU will climb a grade of 27% loaded and the C25-SU a 23% grade with rated load. *Clark Equipment Co.*

... FOR MORE DETAILS, CIRCLE NO. 306

PUMPS

... to handle heavy shock loads



Two new high pressure 90 hp hydraulic axial piston pumps are now available to designers and users of fluid power equipment. The pumps are designed primarily for rugged duty in the mobile,

industrial and other fields where heavy shock loads are inherent with the system and where flexibility is a prime factor. Both pumps feature "Split-Flow" operation which permits independent, multiple circuitry using a single pumping unit. "Split-Flow" resolves problems in synchronizing feeds and speeds in circuits with unequal loads or provides for auxiliary circuit requirements such as full time power brakes, steering, winch operations, etc. When used for "high-low" applications, the unloaded pistons circulate oil which aids in cooling the pump during the high pressure operations. Design characteristics give a high degree of efficiency and safety: Base of maintenance is provided with interchangeable pistons and cartridge design. The two models are designated as follows: Model PF 6033 operating speed 1800 rpm, producing 22 gpm at 6,000 psi. Model PF 3046 produces 29.5 gpm at 3000 psi and 1800 rpm. *Hydraulic Div., Fornaciari Co.*

... FOR MORE DETAILS, CIRCLE NO. 307

FIRST AID DEVICE

... protects against acid and chemical burns

A safety shower with new "ratchet-type" valve operation has been combined with a new cast-aluminum emergency eye-wash fountain. This Model 8359 combines emergency body-drench and eye-wash facilities in a single, simplified unit. Vital first aid is provided, protecting against injury from contamination wherever caustic acids, volatile fuels or dangerous chemicals are manufactured or used. Units are furnished complete, ready for installation. The "ratchet-type" quick opening ball valve on the drench shower is operated by a convenient nylon pull rope. A flood of water is released from the satin-chrome finish, 10" diameter, cast brass shower head. The valve stays open until the ratchet valve rope is pulled again. The eye-wash unit is a new design in polished, cast aluminum. Two chrome-plated brass fountain heads at each side are angled so that a controlled stream of water flushes directly into the patient's eyes. The "push-to-operate" ball valve opens instantly, remaining open until manually closed. *Haws Drinking Faucet Co.*

... FOR MORE DETAILS, CIRCLE NO. 308

TRUCK

... has tilt cab for easy maintenance

A new series of tilt cab tractors for over-the-highway operations, designated the "DC" Series, consists of five models with gross vehicle weights ranging from 26,000

to 43,000 lbs. and gross combination weights of 45,000 to 78,000 lbs. Four are four single axle tractors and the fifth a tandem tractor. Two single axle models are powered by a 6-cylinder engine with horsepower ranging from 145 standard to 185. Three larger models including a tandem tractor model, are powered by a V-8 engine with 207 horsepower as standard and 235 horsepower available as an option. A feature of the series is the hydraulic tilting action of the cab, which quickly and completely exposes the engine and transmission for easy maintenance. The cab is tilted by a manually activating hydraulic pump, which tilts the cab to maximum opening in less than one minute. Tilting is unnecessary for routine checking and addition of oil and water and for battery checking. *White Motor Co.*

... FOR MORE DETAILS, CIRCLE NO. 309

STRAPPING TOOL

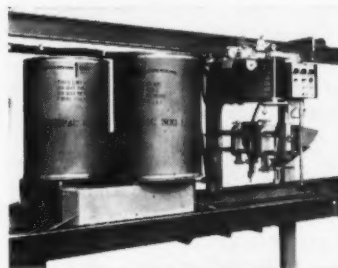
... uses air power

The AMP, a portable all-power-operated combination strapping tool, has been announced. Air power does all the work in this new tool. It engages the feed wheel, tensions the strapping, applies the seal, severs the strap from the coil, and disengages the feed wheel. Previous powered combination models utilized pneumatic or electric power for the tensioning cycle only. Developed especially for the AMP is a new design of self-interlocking nested seal that simplifies loading into the tool, permits partial stacks to be loaded. Nibs in the flanges of the seal hold the stack together and in alignment until the seal is automatically fed into position on the strapping. The AMP's pneumatic power has cut manual operations to a minimum. To complete a strapping cycle, the operator need only open the rear gripper and wipe in the bottom strap end, slide the top strap under the feed wheel, press the tension lever, then the sealer lever, and swing the tool free from the strapping. *Signode Steel Strapping Co.*

... FOR MORE DETAILS, CIRCLE NO. 310

WELDING WIRE

... large container saves downtime



A new 500-pound container of continuous-coil hardfacing wire for automatic welders and track rebuilding equipment, eliminates four coil changes and saves up to two hours downtime per container compared with standard 100-pound layer wound coils. The containers also protect wire against dirt, dust, moisture; and make for easier handling and storage. Automatic wires presently available in containers are Victor VA4X, VA5X and VA7X in 1/8" and 5/32" diameters, developed primarily for build-up of rollers, idlers and other track parts on tractors and shovels. *Alloy Rod & Metal Div., Victor Equipment Co.*

... FOR MORE DETAILS, CIRCLE NO. 311

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311



New slanted "full-vision" cowl that makes load pick-up unusually fast and easy, is an outstanding feature of Towmotor Stream-Liner Series fork lift trucks (above). Load capacities, 3000 to 5000 lbs. Diagram below shows how operator is able to see within 12" of the heel of forks.

TOWMOTOR'S ON THE MOVE

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MEETS GOVERNMENT SPECIFICATIONS
MIL-A-907 QPL-907

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HIGH PRESSURE SEALANT a real thread sealer, pressures held to 50,000 psi hydraulic fluids, 3500 psi air, 1000 psi gases. Has UL approval. For gases, steam, air, ammonia, hydraulic fluids.
CORROSION PROTECTION no corrosion weld, prevents rusting, acid-etch, etc.

SPECIFICATION COMPOUNDS IN STOCK

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MIL-T-5544 NAVORD OSD-53
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• SANGER • SAN JOAQUIN • SELMA • SHAVER-HUNTINGTON LAKES

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SPEED REDUCERS

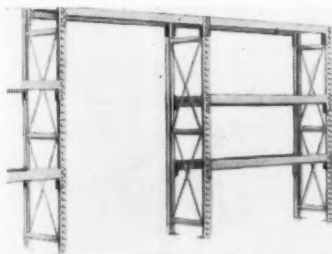
... nine new vertical fan cooled units

Nine new vertical fan-cooled worm gear speed reducers, ranging from 3-inch to 12-inch center distances, are now available. Ratios extend from 4-1/7:1 to 95:1; ratings are fractional to 175 hp. The new units incorporate features, such as fan cooling, specially hardened worms and centrifugally cast gears and have a much higher average rating than comparable reducers not having an auxiliary means of cooling. All units have one-piece finned housings for maximum strength and heat dissipation. Gear shaft bearings are grease lubricated, with two fittings for each bearing. One fitting is used as indicator; grease flowing from it shows that the bearing is fully packed. Oil seepage, often a problem in reducers with downward shaft extensions, has been prevented by incorporating a dry well around the output shaft and extending above the oil level. *Cleveland Worm & Gear Div., Eaton Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 312

RACK

... unit is stronger because no metal removed



This rack, termed the Standard Series 75, combines the advantages of adjustability, versatility and uniqueness. It's unique because there is no metal removal in the construction of uprights. Locks are cold

formed from the material, itself. The Standard Series 75 adjusts on 3" centers without loss of adjustability at bracing points. Versatility is realized inasmuch as the unit has a potential range of 16 possible rack sizes which can be fabricated from standard units. Production has been geared to put the unit in stock for immediate delivery upon order.

The new model can be erected in a matter of minutes. There are no third piece connectors. Cross members lock immediately and positively to the uprights in this two-piece system. Another important aspect of the Standard Series 75 is its appearance an innovation called "Safety White." *Palmer-Shile Co.*

... FOR MORE DETAILS, CIRCLE NO. 313

LIFT TRUCK SUSPENSION

... increases vertical action of steer wheels 50%

New steer axle and spring suspension has increased the vertical action of steer wheels 50% on Champ Tow-A-Lift truck series from 4,000 to 10,000 lb. capacities. The maximum tractive effort on the drive wheels has been retained over the roughest terrain. In addition, road shocks so often a major factor of abuse on lift trucks, have been substantially reduced. The new design centers on the use of conventional auto-type springs with one end fixed to a trunion mounted stabilizer. In this manner only one end of the spring is affixed positively to the frame. *Champ Corp.*

... FOR MORE DETAILS, CIRCLE NO. 314

HEATING - COOLING UNIT

... completely self contained, sets on roof



A completely self-contained roof-top cooling unit and a combined heating and cooling unit for single level buildings has been developed. The cooling system is

available as a separate unit while the year-round temperature control system is a three part package consisting of an air cooled condenser unit, a cooling section, and a gas fired unit for heating. Models are available in 7½ and 10 ton sizes. Over-all dimensions of the complete 7½ ton unit are 139-¾ inches long, 52 inches wide and 44-½ inches high. The 10 ton model measures 151-½ inches long, 60 inches wide, and 44½ inches high. The roof-top system requires only one opening through the roof for combination supply and return air duct. No other ductwork or refrigeration piping is required. With roof-top location, valuable floor area is gained. The packaged unit is enclosed in a weather-proof housing of heavy gauge embossed aluminum sheet. Exterior painting is not required. *Curtis Mfg. Co., Refrigeration Div.*

... FOR MORE DETAILS, CIRCLE NO. 315



METAL CASES ARE OUR BUSINESS

We will make to your specifications:

Metal Enclosures, Tool Boxes and Trays,
Metal Cabinets, Electronic Enclosures,
Work Benches and Drawers, Display Units,
Truck Boxes and Metal Specialties.

We also have a complete line of stock items for the Tool Industry. Phone, Write or Wire...

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... for more details, circle No. 39 on Reader Service Postcard

WESTERN INDUSTRY/APRIL 1961

Babbitt Adjustable SPROCKET RIM with Chain Guide CHANGES THAT DANGER ZONE TO A SAFETY ZONE



... saves you money ON EVERY VALVE

Every minute saved is money in your pocket. Cut out the waste of time, labor, floor space due to hard-to-reach valves. At the same time, convert Danger Zones to Safety Zones. Equip every overhead valve in your plant with Babbitt Adjustable Sprocket Rims with Chain Guides for day to day economy.

- They simplify pipe layout.
- They fit any size valve wheel.
- They are easy to install and operate.
- They operate any valve from the floor.
- They save time and money.
- The first cost is the only cost (no maintenance).
- They are packed completely assembled (one to a carton), with easy-to-follow instructions.
- A hot-galvanized rust proof chain is available for all sizes.

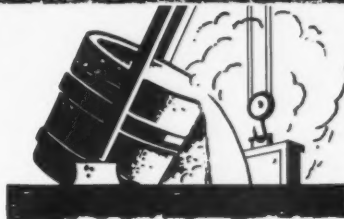
Babbitt Adjustable Sprocket Rims with Chain Guide are carried in stock by most mill supply houses. Just phone your mill supply salesman, or contact us direct.

Babbitt STEAM SPECIALTY CO.

13 BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

... for more details, circle No. 40 on Reader Service Postcard

Stainless Castings



POURED DAILY FOR FAST, FLEXIBLE SERVICE

This smaller, more modern stainless steel foundry offers you the speed and flexibility of several heats a day. It pours leading stainless alloys on a regular basis, other alloys on order to your exact requirements.

An adjoining pattern shop is available for quick quotations, pattern making and alterations. Superior's metallurgists and engineers are ready to help you meet your design and production problems.

For corrosion and heat resistant castings, production or short runs, to 700 pounds and highest X-ray standards, call Superior Alloys, or your nearby sales engineer.

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SALT LAKE CITY — 117 W. 2nd South — DA 2-5553

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GENTLE NEW GROCERY GRABBER! Cases are handled with care when a strong steel clamp puts the light touch on canned foods. Husky USS Plate, Bars and Tubing make steel arms slim and strong; hydraulic units smooth and powerful, for tighter stacking with less danger of damage to cases. Throughout the West, materials handling depends on steel. Fork lift clamps are fabricated by Cascade Manufacturing Co. of Portland, Oregon.

new Western ideas in **USS** steel

"GROUP INSURANCE" FOR FALLEN GIANTS! Holding 40 tons of timber down hairpin mountain roads calls for heavy-duty chain of steel. Made from dependable USS Manufacturers Wire, strong tie-down chains will take a beating anywhere in the woods. Chains by Campbell Chain Company, Union City, California. For more information on wire for chains or steel for any purpose, call your USS representative.

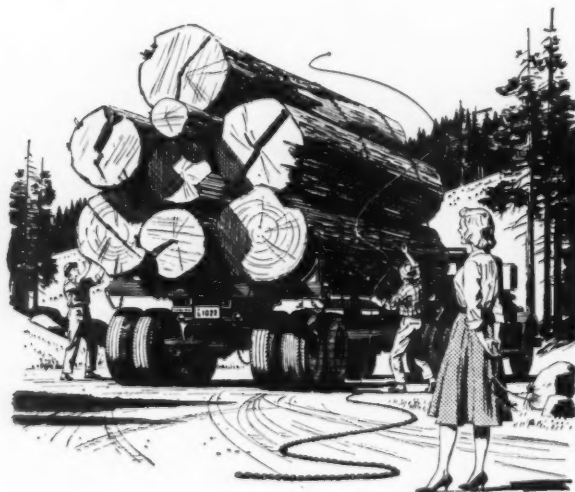
**STEEL FOR EVERY PURPOSE
FROM A SINGLE SOURCE**



LIGHTING STANDARDS RISE AND SHINE! Good outdoor design is here to stay on parking lots and roadways with lighting standards styled in steel. Tall, tapered shafts of steel are on the rise throughout the West. Modern lighting standards are formed from USS Hot Rolled Sheets by Weld-Rite Company of Oakland, California. Because they're steel — wind, weight or wallops will never give them a turn for the worse.

SMART ROPE TRICK WITH TONS OF TUNGSTEN! USS Tiger Brand Wire Rope does the trick on any mining job! Especially here — hauling 1,000 tons of heavy, abrasive tungsten ore per day 4,000 ft. down from the mine by aerial tramway. Reliable USS Tiger Brand carries this load under toughest conditions for Union Carbide Nuclear Co., Div. of Union Carbide Corp., at Pine Creek, Calif. Performance? Assured, with the right rope for the job!

USS IS A REGISTERED TRADEMARK



This mark tells you a product is made of modern, dependable steel. Look for it on the products you buy.



Write Consumer Service, 120 Montgomery St., San Francisco 6



**Columbia-Geneva Steel
Division of
United States Steel**

Western MANUFACTURING

THE INDUSTRIAL WEST . . . ON ITS WAY

NEWS OF PLANTS — PRODUCTION — DISTRIBUTION — PERSONNEL

\$40,600,000 Contract To FM&C at San Jose

SAN FRANCISCO—Subcontractors in 23 states will share half of a new \$40,600,000 Army Ordnance award to Food Machinery & Chemical Corp., San Jose, Calif., for 1500 aluminum armored personnel carriers. Their portion will be \$20,864,300 on 530 subcontracts for supplies, services and components, according to an Army Ordnance announcement March 22.

Of the subcontracts, \$11,500,600 will go to distress labor areas. Small business firms will receive \$4,828,100 in subcontracts, including \$1,549,500 in labor distress areas.

FM&C is the design agent for the M-113 and previously contracted to supply 2580 personnel carriers and related spare parts and services for \$75,000,000. Standardized components and a basic amphibious chassis has given the Army a whole new family of vehicles to increase its battlefield mobility and firepower.

An Orchid to American Can Plant for Safety



Pretty Jacquelyn Cornell, American Can Co., San Francisco, displays an orchid bedecked "shield of safety" bearing the congratulations of the National Safety Council as the Canco plant at Third and 20th streets ticks off its millionth man-hour of work without a lost-time accident. The plant has 1300 employees.

Electric Autolite Opens Wire and Cable Facility

EL SEGUNDO, CALIF. — The Electric Autolite Co. began operation of its new 26,000 sq. ft. wire and cable plant here last month, according to J. M. Gerber, general manager of the Toledo, Ohio, firm's wire and cable operations.

The El Segundo plant, which is Electric Autolite's third wire and cable facility, has a capacity of 500,000 ft. per day and will employ approximately 45, Gerber said.

Majority of the production will be special wire and cable harnesses under contract to West Coast air frame and space vehicle builders and special assemblies for electronics manufacturers.

Lumber Company Opens Honolulu Mill Plant

HONOLULU—The Island Lumber Co., here, has announced the opening of a new \$200,000 mill plant on five acres of land in the Campbell Estate Industrial Park at Barber's Point.

Clarence Furuya, general manager of Island Lumber, said a growing need on the Ewa side of the Island projected the building of the plant. The new mill will provide additional warehouse and storage facilities.

The plant has Honolulu's first fully automatic incinerator, produced by Sargent Building Specialties of Portland, Ore. The incinerator, designed especially for Island Lumber, will burn 2,000 pounds of refuse hourly.

Union Oil Planning Coos Bay Expansion

COOS BAY, ORE. — The Union Oil Co. of Calif., Los Angeles, has reported that it will soon begin construction of wharf and storage facility expansion here at 2300 N. Bayshore.

The expansion, to cost about \$1,000,000, will increase oil importation capacity from 30,000 to 175,000 barrels.

A.P.L. Contracts for Fruehauf Containers



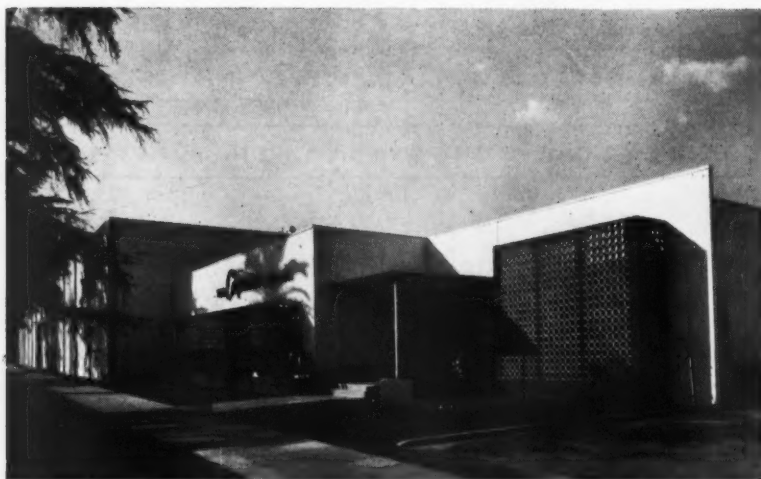
A \$1,250,000 contract for Fruehauf Twin 20's containers is signed by George Killion, president, American President Lines, San Francisco. The vans, which are used interchangeably in rail, truck and ship applications, will be incorporated in A.P.L.'s shipping services to the Far East. They are being manufactured at Fruehauf's Vina Vista, Calif. plant. At left is H. E. Foulkrod, executive vice president of Fruehauf Trailer Co.

SAN FRANCISCO — American President Lines has announced plans to expand its facilities for containerization with the purchase of 420 containers from the Fruehauf Trailer Co. The containers will be used on four ships, including two partial container ships now under construction here at a cost of \$32,000,000.

Commenting on the outlook for containerization, American President Lines' President George Killion said, "This improved service to shippers, through means of an integrated transportation system involving land, rail and sea, offers the prospects of revolutionizing the American method of distribution."

Killion added, "The full benefits of containerization will be realized when a unit shipment of goods can travel across continents without the reopening and heavy documentation now necessary."

New Carpenter Steel Facility at Los Angeles



Exterior View of new Carpenter Steel Co. offices and service center facilities in the Central Manufacturing District, Los Angeles. In all, 20,000 sq. ft. are under roof.

LOS ANGELES — Carpenter Steel Co., specialty steel producer, has opened a new \$300,000 service center at 4423 E. District Blvd., with 20,000 sq. ft. of floor space that triples the size of physical plant, boosts the inventories of specialty steels and increases the ability of the firm to offer technical services to Southland industry.

The new installation serves as Pacific regional headquarters of the firm and is headed by *David J. O'Neil*, Pacific Regional Manager. Included in Carpenter's regional setup are service centers in Houston and San Francisco, sales offices in Seattle and Dallas.



David J. O'Neil

According to Los Angeles Branch Manager, *Robert W. Titgemeyer*, the new service center is stocked to meet Southland needs for specialty, tool, stainless and alloy steels used in jet engines and aircraft, missiles, compressors, marine applications, electronics, nuclear energy and other industrial applications.

A sales office for Carpenter's Alloy Tube Div., is located here also and is headed by *Harry L. Harner*, Tube Div. regional manager. Stocked is high alloy and stainless pipe and tubing, Titgemeyer said.

In addition to inventory services, the new plant will offer increased technical information and assistance.

Titgemeyer believes the demand for specialty steels and new alloys will grow. Increasingly important, he feels, will be high temperature steels able to stand more than 1000 degrees F., harder and tougher tool and die steels, alloys for magnetic and fine wire applications.

F. J. McCauley is warehouse sales service manager and *G. C. Peruch* manages warehouse operations at the new facility.

Astra Tech Acquires New Space, Management

LOS ANGELES—Astra Technical Instrument Corp. will expand operations in additional space at 12930 Panama St., here, where the firm will concentrate on the design and manufacture of temperature measurement systems and compounds, it was announced recently.

Astra-Tech also occupies manufacturing and testing facilities located in Santa Ana, Calif.

New executives given key posts, include *Raymond L. Hixson* as general manager of Astra Tech; *Sumner Goldman*, manager of engineering; *Shep Winter*, manager of manufacturing; and *Dan Fisher* as operations manager. All of the new executives were formerly associated with Arnoux Corp.

Astra Tech has functioned as an autonomous affiliate of Arnoux, a firm engaged in design and development of telemetry equipment and components.

L. B. Foster Co. Opens San Francisco Facility

SAN FRANCISCO — A new branch office and warehousing yard has been opened here by L. B. Foster Co., suppliers of construction products, steel pipe, steel sheet piling and rail and track accessories.

According to *R. A. Anderson*, regional vice president, San Francisco was selected for the new operation to offer faster, more economical service to the fast growing Bay area and surrounding counties. Formerly this area was served from Foster's branch office in Los Angeles.

The new operation will specialize in job-site truck delivery of the entire Foster line including pump column pipe and water well casing. Among those representing the company in the area are *H. Roy Gordon*, branch manager, and *A. M. Filak*. Offices are located at 255 California St.

Weyerhaeuser Expanding Longview Research Plant

TACOMA, WASH. — Plans for a major expansion of Weyerhaeuser Co.'s Technical Center at Longview were announced recently by *Norton Clapp*, Weyerhaeuser president.

Construction, starting about May 1, will increase floor space of the research center by 80 percent.

Clapp said expansion will relieve overcrowding and provide facilities for more efficient handling of a work load which has increased steadily with growth of the company.

"Since establishing the center in 1941, Weyerhaeuser has pursued a program of improving present products and developing new ones, as well as improving manufacturing processes," Clapp said. "We think the expansion will help materially in advancing a program of technology to meet future needs of the company."

The project, scheduled for completion in September, will involve adding 25,350 sq. ft. and remodeling 10,000 sq. ft. of existing quarters for laboratory, office and library space.

Rapistan Moves to Larger Facilities

LOS ANGELES — *Earl D. Hoyt*, president of Rapistan of California, Inc., has announced the transfer of the company's Los Angeles Division operation to new and larger facilities at 5403 Shiela St., here.

AiResearch Phoenix Buys Land, Building

PHOENIX—Two major expansion steps for AiResearch Phoenix, involving acquisition of land and building of additional factory space, has been announced by J. J. O'Brien, division manager.

The company has acquired 24 acres of land south of Washington St. between 34th and 36th streets. Its south line is adjacent to AiResearch property along the Southern Pacific tracks.

Purpose of the land purchase program is to provide space for future expansion, O'Brien said. The company now holds 100 acres at the Sky Harbor Airport location.

Additional factory space has been achieved with the completion of a 12,000 sq. ft. addition to the main plant on the south side. This brings the company's working area under roof to a total of 675,000 sq. ft., O'Brien said.

Twenty acres of the land acquisition tract were purchased from Allison Properties, Inc. including a 65,000 sq. ft. office-factory building which had been leased to AiResearch for the past three years.

Mathews Paint Acquired By Dyna-Therm Chemical

CULVER CITY, CALIF.—Dyna-Therm Chemical Corp., here, has acquired the assets and business of Mathews Paint Co. of Los Angeles, it was announced recently by George M. Joyce, president of Dyna-Therm.

Founded in 1887, Mathews Paint Co. is privately-held and reported sales of \$1,700,000 for the year ended Nov. 30, 1960. In addition to its line of consumer, contractor and industrial paints, the company manufactures flame-retardant and insulating coatings.

Dyna-Therm manufactures high temperature coatings for the missile industry, plastics and specialty building materials. It also markets a line of plastic paints. Sales of Dyna-Therm for the fiscal year ended Sept. 30, 1960, totaled \$1,400,000.

The transaction calls for the issuance of 90,000 shares of Dyna-Therm stock, Joyce stated.

Mathews will be operated as a division of Dyna-Therm and will continue under its present management headed by Richard W. Janeway and Wilford J. Merrill.



ALUMINUM ATOM. THE 13 ELECTRONS ARE DRAWN AT THE PROPER SCALE IN DISTANCE FROM THE NUCLEUS, ACCORDING TO THEIR ENERGY LEVELS.

KILSBY KALEIDOSCOPE

ALUMINUM HOLOBAR (the bar with the hole through it) constitutes part of the enormous Kilsby Tubesupply stock of tubing. The quantities you need and the sizes you need are *always* on hand. Because we are specialists in tubing and *only* tubing, you can depend on us as the source of supply, also, for drawn aluminum, stainless, and alloy steel. You can call on the assistance of metallurgical engineers on our staff for advice on tube applications. No charge. No charge, either, for a copy of our new Stock List which you should have on hand. The coupon below will bring it to you.

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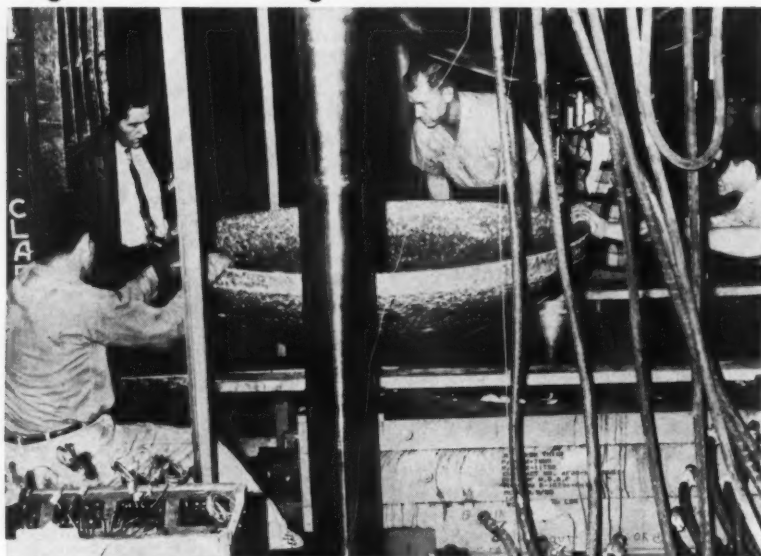
LOS ANGELES, Overbrook 5-7010
SAN FRANCISCO-OAKLAND, ELgin 1-1982

SAN DIEGO, Belmont 9-4812
SEATTLE, MAin 3-6000

Sales Representatives throughout the United States

... for more details, circle No. 42 on Reader Service Postcard

Largest Plastic Molding for Minuteman ICBM



SAN RAFAEL, CALIF. — Aft closure insulation for the first-stage Air Force Minuteman ICBM engine is pulled from die after being compression molded in unusual 2,000-ton capacity press. The "dish" is produced to close tolerances in one piece and in a

single press shot by Dumont Mfg. Corp. The 400-lb., 60-in. diameter reinforced plastics dish, designed to protect the steel structural casing from damage by burning propellant, is said to be the largest and heaviest compression molded part to date.

Compton Foundry Assumes Full Ownership from Borg

LOS ANGELES — Common stock of Compton Foundry formerly held by the Byron Jackson Div., Borg-Warner Corp., has now been acquired in full by the foundry. The announcement was made jointly by James Barr, president and general manager of Compton Foundry and Andrew W. Rose, president of Byron Jackson.

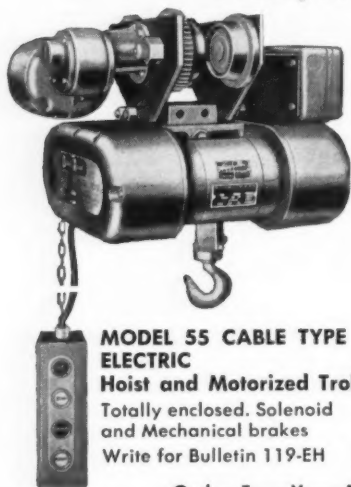
Located in Compton, Calif., the foundry was organized in 1946 and produces iron castings using processes under license from the Meehanite Metal Corp., New Rochelle, N.Y. While originally established as a foundry specializing in complex engineering-type castings, Compton has now added equipment to expand its facilities for "production run" castings, Barr said.

Rose stated: "This fulfills Byron Jackson's original purpose of investment in Compton. We desired to aid in the establishment of an independent Los Angeles source of high quality castings for advanced requirements." He said that the Compton Foundry had filled this need.

David Round

for HOISTING EFFICIENCY

...especially in work areas cramped for headroom



MODEL 55 CABLE TYPE ELECTRIC
Hoist and Motorized Trolley
Totally enclosed. Solenoid and Mechanical brakes
Write for Bulletin 119-EH

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Cable-Aire PNEUMATIC HOIST
Meets requirements for operation in hazardous atmospheres
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District Representatives: Calif., Berkeley—Fletcher Sales, 2300 Fourth St. Los Angeles—Hoist Specialties, Inc., 429 So. Western Ave., Oregon, Portland—B. P. Rutherford, Inc., 122 S.W. First Ave., Wash., Seattle—B. P. Rutherford, Inc., 1954 First Ave. So.

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DAVID ROUND & SON, INC., CLEVELAND 39, OHIO

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EXCLUSIVE SOURCE

For

T-1

construction alloy steel castings

*TM REG. U. S. STEEL

Alloy Steel & Metals Co. was selected as the first foundry to be licensed because of its outstanding performance in producing castings for defense projects.

ADVANTAGES OF "T-1" ALLOY STEEL CASTINGS

Over 3-times yield strength of structural carbon steel.
Weldable without preheating or post-heating.
Outstanding resistance to combination of impact and abrasion.
Reduces weight from 25% to 50%.
Excellent "castability".

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A dependable source for carbon, alloy & manganese steel castings since 1919.



ALLOY STEEL & METALS CO.

1848 E. 55th St., Los Angeles 58, Calif.—LU. 3-3471

... for more details, circle No. 44

Nortronics Div. Plans New Research Facility

ANAHEIM, CALIF. — Plans for a \$1,700,000 multi-story engineering and administration center for the Nortronics Div. of Northrop Corp. were announced recently by *Thomas V. Jones*, Northrop president.

The new research center will be built on the company-owned 50-acre site here, and will be occupied by Nortronics' Systems Support Department. It will serve as a focal point for advanced research and engineering in electronic, electrochemical, optical and a broad spectrum of weapon system support technologies. Construction began April 1.

The Anaheim research center is the sixth major Northrop facility development project currently in progress under the company's three-year \$32,000,000 capital investment program. The new center will be a four-story structure with 90,000 sq. ft. of space for more than 800 engineering and administrative personnel.

In addition to the Anaheim facility, a \$5,000,000 research center is being built for Nortronics' Electronic Systems and Equipment Department at Palos Verdes, Calif.

Coast Steel & Supply Opens Redding Branch

REDDING, CALIF. — The new Coast Steel & Supply Co. opened its new warehouse and sales offices last month on a 5½ acre site at 2305 Radio Lane in the Redding Industrial district.

The company, which will provide a full line of sales and service on rolled steel products for the northernmost section of California, is the newest subsidiary of American Steel Warehouse Co. of Portland. Its operation will be closely associated with those of two other Oregon subsidiaries, American Steel & Supply of Eugene, and American Steel & Supply of Medford.

Mrs. Hugh Hedinger, president of the parent company, announced the appointment of *Robert Rix* as manager of the Redding company and *Dudley Carrico* as office manager.

Coast Steel & Supply's marketing and service will cover pipe products, flat rolled steel, custom-corrugated sheets, wire products, wire rope, along with hardware and mill supplies, and aluminum and copper products.

Factory Addition Underway at Kent

KENT, WASH.—The Lynch Mfg. Co. plant here at 822 Third Ave., S., is currently being expanded, according to an announcement by *Ted Feicht*, vice president of the firm which manufactures furniture and fixtures.

Feicht said that increased production necessitated the addition which will cover some 10,000 sq. ft. and cost approximately \$35,000. Purchase of new equipment for the addition will increase its value to more than \$50,000, Feicht said.

Robbins & Myers Opens Pump Div. Office in Pico Rivera

PICO RIVERA, CALIF. — The Moyno Pump Div. of Robbins & Meyers, Inc., of Springfield, Ohio, has announced the opening of a new branch office here at 7755 Paramount Place.

The office will serve that section of California south of and including the counties of San Luis Obispo, Kern, Tulare, and Inyo with a complete stock of pumps, accessories and service parts.

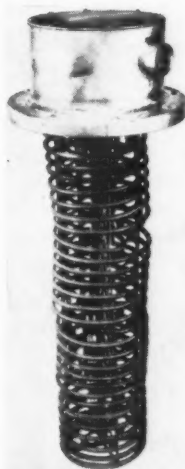
James L. Badgley has been named sales engineer.

MONTGOMERY BROTHERS, INC.

ENGINEERING REPORT No. 11

CLIENT: A Corn Syrup Process Plant

PRODUCT: Chromalox Immersion Heater



Montgomery Brothers, Inc.

REPRESENTS

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Co.
Commercial Filters
Corp.
Pacific Chromalox
Sta-Warm Co.
Kanthal Corp.
Sherman Industrial
Electronics Co.
General Equipment
Mfg. Co.
Aquomatic Valve,
Inc.
Radcor, Inc.



**"We Have A Problem Heating Our Corn Syrup.
Can You Design A Heater For Such A Job?"**

This customer really did have a problem. Corn syrup, a heavy viscous material, must be heated to allow easy pumping. The basic problem here, of course, is the fact that corn syrup will caramelize at 190 degrees. This fact in itself eliminates any standard type of heater.

Montgomery Brothers Inc. designed the above heater for this difficult application. The total wattage capacity is 4500 and is rated at 440 volts. The amazing thing about the heater, however, is that it has 60 feet of tubular element coiled in thirty inches of depth. **THIS GIVES A TOTAL WATT DENSITY OF 4.5 WATTS PER SQUARE INCH!** There will be no caramelizing on this heater.

This application illustrates one of the many unusual problems presented to Montgomery Brothers Inc. Do you have a difficult application? If so, why not call today. Engineering help is only minutes away.

Oh, by the way, our "No Obligation" engineering service is unparalleled in the heating field! Just thought we would mention it.



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SPECIALISTS IN ELECTRIC HEATING, FILTRATION & CONTROLS FOR OVER 30 YEARS

... for more details, circle No. 46 on Reader Service Postcard

General Electric Forms Industry Control Dept.

PHOENIX—The General Electric Computer Department has announced the formation of a new and separate Industry Control Department specializing in new industrial computer business.

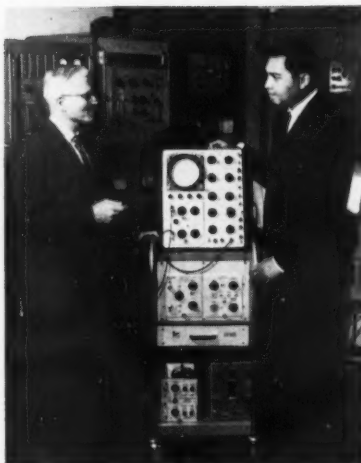
Clair C. Lasher, general manager of the computer department, said the industry control department manufactures automatic control equipment for process industries, such as systems for steel, cement and other plants.

Prior to the division, the computer department in Phoenix had responsibility for both business and industrial data processing systems, Lasher said. The business systems are produced at the Deer Valley plant while the industrial line is manufactured in a nearby facility.

Lasher said both organizations will continue operations in Phoenix.

Bertram W. Mahoney, general manager of the industry control department, has named Raymond C. Berendsen general manager of the new process department. He formerly managed advance projects and marketing for GE's ordnance dept. at Pittsfield, Mass.

Discuss NASA-Western Scientific Contract



Howard A. Maxwell, left, electronic instrument maker at Ames Research Center of the National Aeronautics and Space Administration, Sunnyvale, Calif., discusses new contract with L. R. Baird, project engineer for the Western Scientific Instrument Co., Inc., Redwood City and Van Nuys, Calif.

REDWOOD CITY, CALIF.—Western Scientific Instrument Co., Inc., has received a contract to calibrate, maintain and repair electronic instruments vital to research in space vehicles and aircraft in Ames Research Center of the National Aeronautics and Space

Administration, Moffett Field, Calif.

Announcement of the assignment was made by Jay Dobrin, president of Western Scientific. The contract includes virtually all oscilloscopes and electronic "counters" in use at Ames, where electrical and electronic instruments are teamed for a wide variety of measuring and counting tasks salient to studies in space and aircraft technology. The studies are being conducted in various wind tunnels and other research facilities.

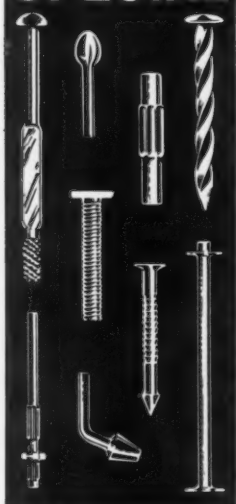
Western Scientific is the first commercial scientific laboratory in Northern California whose precise measurement capabilities are certified to be equal in accuracy to those of the U. S. Bureau of Standards.

Ziegler Steel Names Salt Lake Area Representative

SALT LAKE CITY — Marvin D. Stewart, Allied Industrial and Metal Sales, here, has been appointed as sales representative for the Ziegler Steel Service Corp. for Utah, Southern Idaho and Wyoming.

Ziegler Steel operates distributor plants in Los Angeles, North Hollywood and Oakland, Calif.

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Tinsley Laboratories Occupy New Facility

BERKELEY, CALIF. — Tinsley Laboratories, Inc., designers and manufacturers of astronomical telescopes and optical systems, recently moved to its new plant and office building at 2448 Sixth St. and Dwight Way, here, according to *Harvey L. Morton*, president of the firm.

Increasing by three times the amount of usable floor space, the new building contains more than 20,000 sq. ft. and provides off-street parking. Offices occupy 4,000 sq. ft. of ground floor space and share an additional 4,000 sq. ft. of mezzanine space with quality control testing facilities.

"Using low-cost, pre-cast methods of construction for the building, we achieved a poured architectural concrete effect with a modular pattern," stated *John F. Tulloch*, Oakland, general contractor for the project.

Among unique features of the new plant is a built-in tunnel, which will be used for checking the focal length of mirrors and lenses. Remote control instrumentation is located within the tunnel. For demonstrating and testing astronomical telescopes, a portion of the roof will roll back.

Expansion of quality control facilities included the complete planning of product flow and machinery layout to insure drain-off of residuals.

Expanding Specialty Metals Distribution

SAN FRANCISCO — Entry of the Republic Supply Co. of California into specialty metals distribution in the San Francisco Bay Area was announced recently by *R. M. Chewning*, vice president and general sales manager.

Chewning said the company is expanding facilities so that a large inventory of specialty metals can be stocked to meet immediate delivery requirements. According to Chewning, Republic plans to begin Bay Area distribution activities before summer. The company presently operates a specialty metals division in Los Angeles.

Stocks will include stainless steel sheet, plate, bars and billets, plus cold finished carbon and all commercial alloy bars. Aluminum sheet, plate, bars and structurals will also be stocked.

Three Acre Building For Portland Firm

PORTLAND—Fought & Co., Inc., plans to build a plant covering three acres under one roof at 14355 SW 72nd St., Tigard, Ore. Now located on Swan Island, the company has filed an application to build a 121,800 sq. ft. plant, one story except for a two-story office structure.

The company, which operates a machine shop and fabricates and erects heavy steel, is expected to employ about 60 men and eventually 100.

Spectralab Instruments Acquired by Microdot

SOUTH PASADENA, CALIF.—Microdot, Inc., here, has acquired Spectralab Instruments Co., Monrovia, Calif., for 35,000 shares of Microdot stock.

The acquisition marks the fourth by Microdot since Oct. 1, 1960, the third in the telemetry field. Spectralab is operating at a profit, according to the report, and should contribute about \$500,000 in additional sales in the remainder of Microdot's fiscal year ending Sept. 30, 1961.

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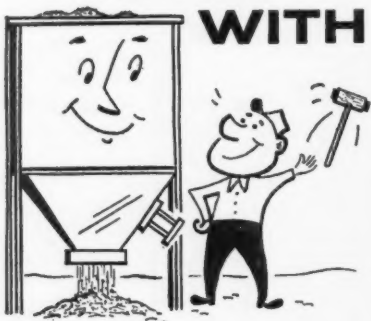
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Plant Improvement at Martin Decker Opening



Clayton Howard, Martin Decker Industrial Div., details features of new environmentally controlled laboratory built by firm to calibrate wide range of measuring systems. Lab instruments have been checked and calibrated by U.S. Bureau of Standards.

LONG BEACH, CALIF.—Martin Decker Corp., manufacturer of precision pressure instruments, testing, weighing, load and force measurements devices opened plant facilities to visiting members of the trade press who toured manufacturing areas and were briefed on recent new products.

Major improvement at the Long Beach plant is a new environmentally controlled laboratory featuring ionized and filtered air controlled to plus-minus one degree F. variation by a heat pump system.

Reference standards for calibrating devices in the laboratory are traceable to the Bureau of Standards in Washington D. C. For testing of weight measurement products, the firm built their own single-lever weigh

beam since no such device is commercially available. Accuracy of this device is better than 1/40th of 1% according to the Los Angeles County Bureau of Weights and Measures.

Primary pressure standard in the lab is a Harwood Engineering Controlled Clearance Piston Gauge identical in design to one based at the National Bureau of Standards. This



Plant metallurgist describes parts breakdown of Industrial Division instrumentation. Here precision bourdon-tube gauges are produced for precise pressure measurements.

device measures pressure values to 30,000 psi with maximum error less than one part in 10,000.

New products described by E. L. Decker, president of the firm, included higher capacity crane scales up to 60,000 pounds and a new precision test gauge that reads in certain models to 15,000 psi increments with up to 25% more accuracy.

Cox to Enlarge Tacoma Rental Machinery Plant

TACOMA, WASH.—A. H. Cox & Co. of Seattle has announced expansion of its rental machinery plant and yard facilities at 2202 Center St., here, according to E. E. Dionne, president and general manager.

An addition to the present building will bring the floor area to 6,000 sq. ft. and about 6,500 sq. ft. has been added to the plant yard to accommodate the movement and storage of the increased stock of both rental and sales equipment.

Arrow Plastic Molders Acquired by Mirra-Cote

EL SEGUNDO, CALIF. — The Mirra-Cote Co., here, has announced the recent purchase of all assets of Arrow Plastic Molders, Inc., of Inglewood, Calif.

According to the announcement, Mirra-Cote has expanded its plant and warehouse facilities so that all equipment of both companies can be integrated in the El Segundo location to provide complete facilities for design, tooling, injection molding, plating and decorating of plastic parts.

United Pacific Extends Option on Plantsite

LONGVIEW, WASH. — The United Pacific Aluminum Corp. has extended its options to purchase property in the Willow Grove area west of Longview.

Soil tests are being conducted at the site of the proposed aluminum reduction plant which would supply United Pacific's fabricating plant.

Last month United Pacific shareholders voted to exchange United's assets for stock in the Cerro Corp. of New York. It is not known what effect this would have over United Pacific's plans to locate a plant in the Longview area, however, R. H. Lewin of New York, a vice president of the Cerro Corp., said prior to the sale, that if it were approved Cerro would "study the situation."

New Steel Works Firm Opens in Boise, Idaho

BOISE, IDA.—The Bautsch Steel Works, Inc. opened here last month at 420 Marden St., according to an announcement by J. E. Bautsch, president, and general manager.

Bautsch leased the plant and equipment of the Chattin Ditcher Co. The firm will fabricate all types of structural and miscellaneous steel items. It also will specialize in the manufacture of custom-built heavy machinery semi-trailers.

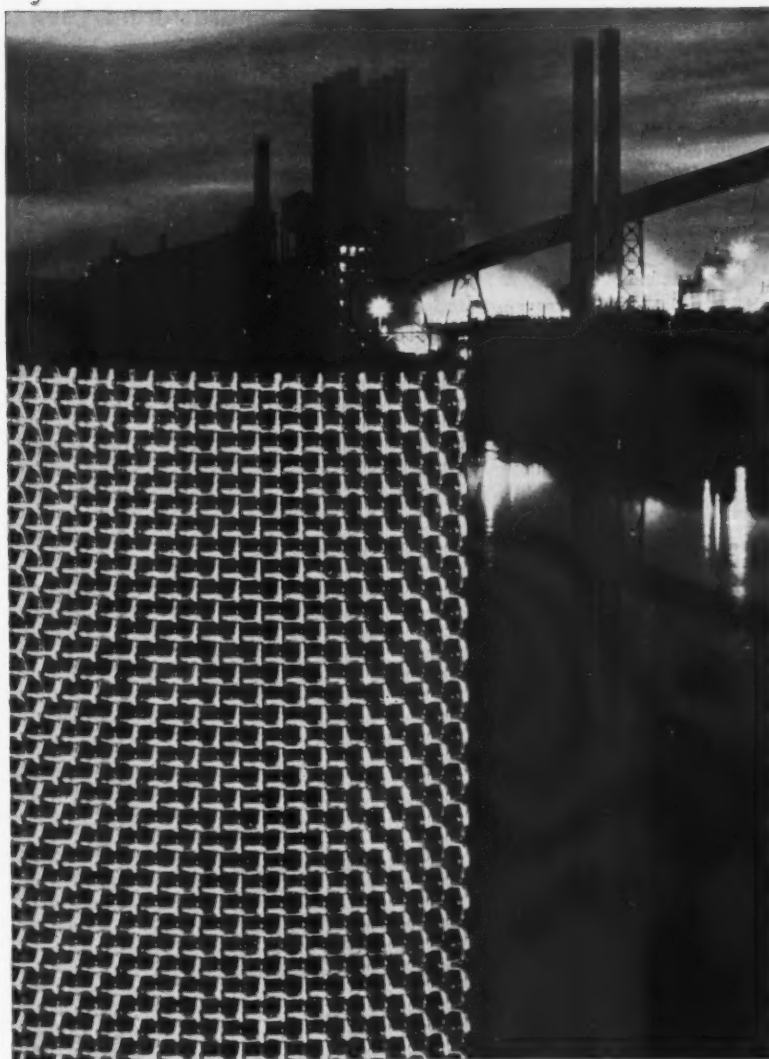
Specialty items of steel plate, bars and structural shapes will be produced to order, Bautsch said.

Acquisition, Expansion for Baker Electric Co.

DENVER — Baker Electric Co., local electric motor repair and supply house, has recently purchased the bulk of the Ward Electric Co.'s inventories and repair plant machinery.

To accommodate its expanded service facility, Baker has also increased its plant size to approximately 13,500 sq. ft. The new plant addition will house a production type small motor repair shop, a complete welder and hoist repair department and a submersible pump motor repair department.

Ward Electric, after discontinuing their service business, will purchase and operate the Electric Motor Supply Co., which handles both repair parts and raw materials for the repair of electric motors.



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Honolulu and Arizona Distributors for Apex

LOS ANGELES — Islands Welding & Supply Co., Ltd., Honolulu, a subsidiary of American Factors, has been named exclusive distributor of Apex Standard Steel Buildings in the State of Hawaii and all U.S. Pacific Island possessions, according to *Robert Grover*, president of Apex Steel Corp., Ltd., Los Angeles.

Earl Gould, vice president of the island firm, will be in charge of sales of Apex's pre-engineered rigid-frame steel buildings.

Allison Steel Manufacturing Co. in Phoenix has been named sales representative of the steel buildings in the entire State of Arizona, with *J. P. Anderson* in charge of sales.

M. D. Hecht Associates Named Fluorocarbon Rep

FULLERTON, CALIF. — The Fluorocarbon Co., here, manufacturers and processors of Teflon and Kel-F products, has appointed M. D. Hecht Associates as sales representative for Arizona, New Mexico and Utah, according to *Sandy Poteet*, Fluorocarbon president.

MEG Manufacturing Div. Transfers to Seattle

SEATTLE — Transfer of the MEG Mfg. Div. of Mandrel Industries, Inc. to Seattle from Burbank, Calif. has been completed. The new facilities here give MEG 12,500 sq. ft. of plant space at 1738 Weller St.

The plant will be engaged in the manufacture of cable products and special cable assemblies for the missile, electronics and aircraft industries, according to *Dyle D. Mize*, Mandrel's executive vice president.

Aluminum Firm Plans Trentwood Laboratory

SEATTLE, WASH. — Kaiser Aluminum & Chemical Corp. has announced plans to establish a Can Technical Service Laboratories at the Trentwood, Wash., Works, near here.

Purpose of the laboratories is the applied development of aluminum container specifications to meet selective product requirements, and a packaging laboratory service to manufacturing and sales organizations.

Laboratory facilities are being built adjacent to the aluminum can stock lines in the Trentwood plant.

Bagasse Paper Plant Plans Are Abandoned

HONOLULU — The Crown-Zellerbach Co. has "unofficially" abandoned plans to establish a bagasse paper plant in Hawaii. Bagasse is the fibrous residue from cane sugar production. Recently Crown-Zellerbach Corp. and the Hawaiian Sugar Planters Association announced a joint agreement with *Sahu Jain, Ltd.*, of Calcutta, India, to provide technical assistance and patent rights for the production of newsprint from bagasse.

According to a report in the *Honolulu Star Bulletin* the Hawaiian Sugar Planters Association has not given up hopes of eventually manufacturing paper from cane waste. *Harold Eichelberger*, senior vice-president of American Factors and a member of the Hawaiian Sugar Planters Association's economic study committee, said Crown-Zellerbach feels that a plant in Hawaii would be "economically unfeasible."

Eichelberger added "It's not the technology of the process, which is excellent, that has caused Crown-Zellerbach's decision. It's simply the economics of setting up a new industry."

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Develop Powerful X-Ray For Missiles, Rockets

CONCORD, CALIF.—A new linear accelerator was recently installed in the Quality Evaluation Laboratory, Naval Ammunition Depot, here, that provides the Depot with the finest X-ray photographic capabilities in the United States, according to *R. B. Heilig*, Commanding Officer at the Depot.

Designed and built by Varian Associates, Palo Alto, Calif., the 10,000,000 volt radiographic linear accelerator, or linac, is a giant X-ray machine. Its powerful X-ray beam will search missile components and solid fuel for flaws, cracks and voids that might cause the missile to fly erratically.

Heart of the machine is a powerful "electron gun" which aims a pulsed barrage of electrons at a gold target, causing it to emit X-rays so powerful they can radiograph a five-foot thick section of missile fuel in a matter of minutes. A permanent record on X-ray film is thus produced for analysis by missile inspectors. Flaws as small as a few hundredths of an inch in diameter can be detected.

The X-ray head is designed so that it can be rotated 360 degrees in a vertical plane. The linac is mounted on a turntable which rotates 360 degrees in a horizontal plane and is suspended from a telescoping overhead crane. Thus, the linac is capable of getting into and around bulky, odd-shaped objects which otherwise would be difficult to X-ray.

Dr. W. J. McBride, manager of Varian's Radiation Div., said other models of the linac are expected to have wide application in industrial radiographic testing. The linac is available in several energy and power levels to meet many industrial test situations.

Frank C. Hunt, Laboratory Technical Director at the Depot, said "In a very real sense, this linac represents a joint effort between our Quality Evaluation Laboratory and Varian Associates. We needed a high energy radiation generator which would give us the flexibility and power required to test nuclear submarine components and large solid propellant missile engines. We provided the operational requirements and specifications and Varian designed the linac from the ground up to meet specifications. The Navy supported a portion of this development at a cost of \$89,000,000."

Hide Curing Plant For Yakima Valley

YAKIMA, WASH. — *Carl Crites*, of the Yakima Chamber of Commerce, announced last month that construction of a \$100,000 hide-curing plant at Union Gap will begin immediately.

To be known as the Northwest Packers Hides Co., Inc., the facility will handle 450 to 500 hides per day. The plant is being built by four packing houses in conjunction with a Chicago hide brokerage firm.

Sciaky Bros. Transfers Research to Chicago

LOS ANGELES—The Research Division of Sciaky Bros., Inc., 2311 Purdue Ave., here, has been transferred to their recently enlarged plant facility in Chicago, Ill.

The move was made to centralize and integrate research and development work with the main plant's laboratory and manufacturing facility which is located at 4915 West 67th St., Chicago 38.

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Transit-mixed concrete and reinforcing steel were ordered to the site in a hurry. Ziegler's quick Delivery Service got the steel to the job before the concrete arrived, in time to avoid serious damage.

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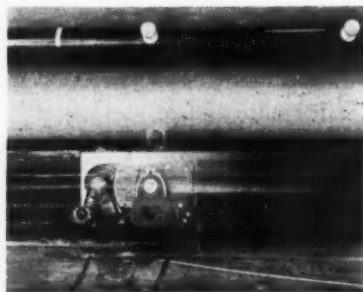
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Automated Facilities Up Carpet Mill Production

SANTA MONICA, CALIF. — A specially designed 6000 sq. ft. mill facility is using automated techniques to produce a wide range of single needle carpet, and according to the founder of Sallee Carpet Looms Inc., high production and low labor costs were not the only reasons for turning to automatic production.

Ralph Sallee, who designed and built practically all production equipment used by the firm, also designed the new plant structure. He says that in addition to speeding production, his single needle looms powered by ½ horse General Electric motors have the advantages of machine made products while retaining the appearance of a hand made item. Looms are self controlled and will stop automatically by activation of limit switches in case of mal-function.

An in-plant material handling system uses a Chisholm-Moore Lodestar



A General Electric AC ½ horse motor powers single needle loom. Motor and linkage to operate needle is bracketed to a sliding assembly that whips back and forth along the length of carpet being loomed. Parts are extremely simple, easily purchased and rapidly replaced with basic tools.



Worker hoists carpet for loading on truck by using a CM Lodestar hoist and a tubular steel grapple. One hoist is equipped with scale to register shipping weight.

overhead electric crane hoist linked to a tubular steel grapple that quickly straddles bulky rolls of heavy carpet. As the carpet is lifted it is weighed by a scale attached to the crane load chain, thereby compressing two material handling jobs into one.

According to Sallee, all moving parts in mill machinery can be replaced at local sources. Sallee's looms, built by him to his own specifications, are completely portable and are mounted on casters. Accessories, such as belting needed to adjust type and rate of output on looms, are stored in simple wall racks adjacent to each loom.

If replacement of parts or motors is necessary the operation can be performed with basic hand tools.

Motorola at Phoenix Completes Expansion

PHOENIX—Work has been completed on a \$3,000,000 addition to the Semiconductor divisional plant of Motorola, Inc., according to Dr. Daniel Noble, executive vice president.

The 355,000 sq. ft., three story building will contain some \$2,000,000 in manufacturing equipment. Construction on the addition began a year ago and the overall plant square footage now totals 555,000.

Along with the building expansion, Motorola has completed a 3,000-car parking facility adjacent to the plant. When the plant's operating capacity is reached some 3,000 employees will be used, Noble said.

Vagabond Coach Opening Plant at Kingman, Ariz.

KINGMAN, ARIZ.—A new mobile home plant, which will employ 125 persons, will be manufacturing trailers beginning this summer, it has been announced by the Vagabond Coach Mfg. Co. of New Hudson, Mich.

The 50,000 sq. ft. Vagabond plant here will be located at the Kingman Air Field. The company plans to produce 500 mobile homes a year at the plant.

"This is Vagabond's first manufacturing entry into the Western market," F. C. Burt, company president said. "We have spent almost a year surveying possible sites for our new plant."

Steel Tube Producer in Expansion Program

LOS ANGELES — An expansion program aimed at doubling its capacity to produce welded steel tubing was announced recently by Epps Industries, Inc., here.

President **Bernard S. Epps** said the program, representing an investment of \$150,000, includes installation of a second electric weld steel tube mill scheduled to be in operation April 1.

Demand for welded steel tubing is increasing steadily for use in products ranging from "pogo sticks and dinette sets to auto tail pipe extensions," Epps said. He noted that recent production innovations have made welded tubing economically feasible in many new applications.

Epps distributes in the 11 Western states and Hawaii.

Oregon Welding Firm Relocates in Utah

PROVO, UTAH — Commercial Welding Co. of Baker, Ore., has announced it will make its main plant here, according to **Albert L. Croxson**, president.

The firm, which makes Powder River steel ranch equipment, will eventually hire about 50 men, it was reported recently.

The plant will be established in the old Provo Foundry and Machine Co., 900 South and 400 East, where abandoned buildings and 30 acres of land have been purchased from the Pipeline Service Corp., present owners.

Croxson said low cost and closely located Geneva steel is the primary reason for the move. The firm has been in Baker for 25 years and employs 35 men, using about 2,000 tons of steel daily.

Huck Mfg. Co. Appoints Arizona Representative

SCOTTSDALE, ARIZ.—**E. J. Foley & Associates**, here, has been appointed to represent the Special Products Div. of Huck Mfg. Co., Detroit, for the Arizona and New Mexico territory.

The Special Products Div. produces custom close-tolerance headed and roll-formed parts on special order. Huck is equipped with cold heading and roll forming machinery for production of parts made from wire diameters up to one inch in aluminum or carbon steel and up to three-fourths inch in stainless steel.

Foley offices are located at 3840 North Jokake Dr.

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This Unusual Situation involves moving 60 to 70 tons of broken bottles during an 8-hour day — first unloading incoming cullet, then stockpiling and later reclaiming it to feed the crusher. For these operations, they recently purchased a Model H-25 PAYLOADER that handles up to 1900-lbs. of cullet per bucket load.

Foreman Henry L. Finley Says: "I've used PAYLOADER tractor-shovels in this department for 14 years with dependable, high production output and low downtime. Now, our new H-25 has replaced two older HA's, doing the same operation. Its power-shift transmission has less wheel spin which insures faster loading and considerable less tire wear. Its roll-back bucket gives less spillage for a much cleaner work floor condition."

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Hathaway Acquires Western Hydraulic

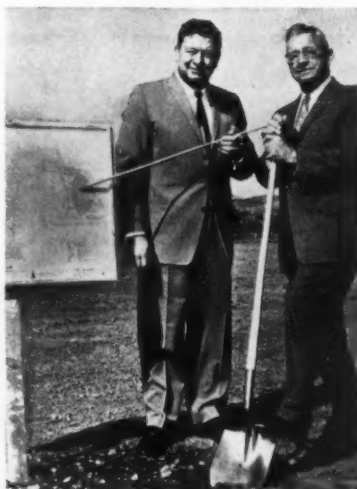
DENVER — Hathaway Instruments, Inc., here, has acquired Western Hydraulic and Service Co., Inc., of Los Angeles, manufacturer of hydraulic and pneumatic equipment, it was announced last month by D. J. Jones, board chairman of Hathaway.

The purchase, involving an undisclosed amount of stock and cash, includes Western Hydraulic's patented "Tog-Loc" internal mechanical locking cylinder, the announcement stated.

Western Hydraulic, a privately-held corporation, had sales of \$1,500,000 for the year ended Dec. 31, 1960. It produces hydraulic equipment for missile ground support systems, commercial and military aircraft and mobile industrial units. Founded in 1949, the company occupies a 40,000 sq. ft. plant and has 140 employees. Hathaway reported sales of \$15,875,658 for the 1960 calendar year and is currently operating at an annual rate in excess of \$20,000,000.

Western Hydraulic will become a division of Clemco Aero Products, operating under the management of Glenn Gorman, president.

Special Devices, Inc., Expansion Underway



Dell Lytle, vice president and general manager of Special Devices, Inc., left, and L. G. Lytle, president, initiate work on eleven new buildings which will complete company's new ordnance facility in Placerita Canyon, Newhall, Calif.

PACOIMA, CALIF. — Construction is underway on expanded facilities for Special Devices, Inc. at Placerita Canyon, Newhall, Calif., with plans for occupancy in June, according to a company announcement.

Located on a 250-acre mountain site near Los Angeles, the eleven new buildings under construction will bring the number to sixteen. Five buildings are already in operation.

Currently located on a 15-acre site in Pacoima, Calif., the new location will provide space for unlimited expansion and offer the most modern manufacturing, process and testing facilities available.

Special Devices, is engaged in a variety of ordnance research, development, and manufacturing programs for the aeronautics and astronautics industry. The company was formed in 1928.

Minetti Machinery Named Olson Coolant Distributor

SAN FRANCISCO — Appointment of Al. Minetti of Minetti Machinery Co., 1485 Bayshore Blvd., here, as distributor of Olson Coolant Cleaning Equipment in the San Francisco Bay Area has been announced by Olson Filtration Engineers of Cincinnati.

Minetti is past chairman of the American Society of Tool Engineers.

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Victor To Distribute Murex Welding Line

SAN FRANCISCO — The Victor Equipment Co., supplier of welding and cutting equipment and related products, with executive headquarters here, has been named prime distributor for Metal & Thermit Corp.'s Murex line of welding electrodes, machines and accessories in the Southern California area. According to L. W. Stettner, Victor president, Victor will handle the Murex line through its four sales outlets in Southern California. Victor will also handle Murex products in Northern California.

Products covered in the agreement, which is the first of its kind made by the Welding Products Div. of Metal & Thermit, include: more than 1,000 types and sizes of Murex mild steel, low alloy, stainless steel and specialty electrodes. AC, DC and AC-DC arc welders, inert arc AC welders; high frequency arc stabilizers for inert gas and metallic arc welding; portable spot welders; portable arc welders; and welding accessories.

New Distribution Center for Rome Cable Division

SAN FRANCISCO — The Rome Cable Div. of the Aluminum Co. of America has moved its Northern California distribution center from San Francisco to the Utah Construction & Mining Co. Industrial Park in South San Francisco, it was announced recently.

Ross Fraser, president of the Rome Cable Div. of Alcoa at Rome, N.Y., said the new 25,000 sq. ft. facility at 277 Utah Ave., represents a doubling of the capacity of the warehouse the company vacated at 1100 Selby St., San Francisco. The \$250,000 building is located on a one-acre site.

The Rome Cable Div. is a supplier of transmission tower conductors, conduit, bus bars, insulated and non-insulated wire.

Pioneer Alaska Firm Opens New Facilities

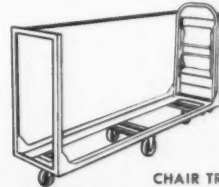
ANCHORAGE — The Carrington Co., a pioneer Alaska firm in business since 1915, has occupied a new \$100,000 facility at 420 Post Rd., here. Carrington is a distributor of International-Harvester trucks, tractors and parts.

The new building has 7,500 sq. ft. of floor space, bringing the total space for the Anchorage branch to 12,000 sq. ft.

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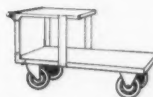
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\$2,000,000 Potato Plant For American Falls, Idaho

WESTON, ORE. — *F. Gilbert Lamb*, president, recently announced awarding of general construction contracts for the new Lamb-Weston potato processing plant in American Falls, Ida., to McCormack Construction Co., Pendleton, Ore. The contracts call for the construction of a zero storage warehouse 240x360 ft. and an office and processing building 120x360 ft. Total expenditure for both buildings and equipment will be approximately \$200,000.

Incorporating many of the experience lessons gained in the development of the "shelled-at-the-plant" pea processing plant at Weston, the new refrigerated warehouse will use a "new and novel refrigeration cycle developed in conjunction with Monroe Food Machinery, Inc., Thermal Engineering Division, in Portland, Oregon," according to *Arthur Davidson*, head of Lamb-Weston's engineering department. The 72,000 sq. ft. warehouse will be built with tilt-up slabs, truss roof and a special dry wall insulation.

U.S. Steel Opens Research Center At Provo, Utah



Newly completed Raw Materials Research Laboratory located adjacent to Geneva Works, Provo, Utah, where about 30 research scientists will conduct intensive studies on Western iron ores, coal, coke, limestone and other raw materials for the Columbia-Geneva Div., U. S. Steel.

PROVO, UTAH—Announcing the opening of Columbia-Geneva Division's new Raw Materials Research Laboratory here last month, *J. D. McCall*

Div. president said;

"More than ever before the key to the future for steel lies in research, finding better ways of making new or improved products and conserving our natural resources of steelmaking by putting them to the most efficient use."

Among research projects slated for the new center will be the testing of drill cores sent in by Western investigation teams, studies on the upgrading of iron ores and limestones, research on improved ways of agglomerating, or "binding" iron ore, and studies on coal blending and carbonization.

A wide variety of scientific testing apparatus will be used from miniature coke ovens to the latest equipment for high-temperature microscopic photography. A two-story, high-bay area at the rear of the building is equipped with adjustable, multi-level floors to permit combining individual processing units into continuous testing systems.

Products Donated to Colleges by Engineered Electronics Co.
SANTA ANA, CALIF. — Engineered Electronics Co., here, has initiated a program of donating products to colleges throughout the country for student use.

The first group of participants received a complete rack-mounted digital systems breadboard kit.

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Aerojet Building Azusa Facility for Satellite

AZUSA, CALIF. — Aerojet-General is constructing a \$1,250,000 facility at its Azusa Plant to test and manufacture infrared subsystems for the Air Force MIDAS satellite. The facility is expected to be ready in April.

MIDAS (Missile Defense Alarm System) is an important research and development program designed to give the U.S. a military satellite system capable of detecting, with Aerojet's infrared "eye," and sending advance warning of an aggressor ballistic missile seconds after it leaves the pad. The company's Avionics Div., directed by Vice President John S. Warfel, is under subcontract to Lockheed Missiles and Space Div. to develop this infrared equipment for the Air Force Ballistic Missile Div.

The new production facility is a 30,000 sq. ft. concrete block building with one of the largest and purest "operating" rooms in the world. The 24,000 sq. ft. room encloses the testing, manufacturing and assembly area in a dust-free atmosphere. Impurities are filtered down to one micron size. Dust particles this small are so light they stay suspended in the atmosphere and will not settle out on delicate MIDAS components. To maintain this air-tight integrity, the 400 technicians will be clothed in white and enter and leave the room through an air lock.

Pacific Valves in Pact with Weir-Valves Ltd.

LONG BEACH, CALIF. — Pacific Valves, Inc., here, recently negotiated a trade and manufacturing agreement with Weir Valves, Ltd., of Glasgow, Scotland, according to Pacific Valve officials.

The agreement provides that Weir-Valves will have manufacturing and marketing rights to Pacific's entire line of valve products for the petroleum, refining, petro-chemical, nuclear and missile fields.

Weir Valves, Ltd., an old-line company in the marine valve industry, has changed its name to Weir-Pacific Valves, Ltd. and all valves manufactured at the Scotland facilities will carry this designation.

According to officials of the Long Beach company, Pacific Valves will be in a far better position to compete with the foreign market as a result of the new agreement.

Western Distribution Center for Ohio Gear

SAN FRANCISCO — The Ohio Gear Co. of Cleveland, Ohio has opened a new distribution center here at 142 Utah Ave., South, for the company's line of stock gears and speed reducers. The new center will carry a complete line of power transmission products for overnight delivery to industry in the eleven Western state area.

Parker-Hannifin Moves Los Angeles Office

LOS ANGELES — Relocation of the Parker-Hannifin sales office for industrial components for the Southwestern region, from 5827 West Century Blvd., here, to new quarters at 10567 Jefferson Blvd., Culver City, Calif. has been announced by T. H. Thoresen, Western sales manager for Parker-Hannifin.

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INVESTMENT CAST steel valve body is held by Arwood sales representative Jack Orr. Firm is devoted to casting of wide range of ferrous alloys and also production machining.



DISCUSSING ITEMS included in Pacific Tube Co. exhibit are D. M. Ladd, tubing sales; Wayne S. Colmery, chief metallurgist; and H. W. Black, tubing sales. Firm exhibited ground and polished tubing,



EXHIBIT SHOWING diverse line of metal products carried by Ducommun Metals and Supply is readied by Paul Berney, Frank Edwards, and Paul Anfang.

12TH WESTERN METAL Congress & Exposition

Western plant management sees latest advances in tools, materials and fabrication in ASM sponsored show.

LOS ANGELES—With attendance hopes based on an expected 35,000 plus, the ASM Western Metal Congress and Exposition opened in Los Angeles with exhibits heavily keyed to machine tools and judging by the wide range of industries represented at the registration booths, progress in metals seemed to be almost everybody's business.

Metal Show spokesmen expected the heaviest influx on plant operators, metals engineers, and purchasing representatives on the third day of the show that closed 6 p.m., March 24.

Although exhibits were fewer than in 1959, Pan Pacific Auditorium and adjacent pavilion were filled with 300 exhibiting firms. Strong local and West Coast participation was noted this year with numerous smaller firms exhibiting for the first time, many of them showing highly specialized tooling, processes and materials.

As expected, major metal suppliers followed the trend of the 100 paper technical program by placing heavy emphasis on aerospace materials, and fabrication methods. Following this trend was the keynote speaker of the Metal Congress opening day luncheon, Maj. Gen. O. J. Ritland, Commander of the Air Force Ballistic Missile Div., who told conferees that the importance of metals has assumed a pre-eminence in the fabrication of defense hardware, particularly in items used by aerospace forces.

He pointed to present day aircraft such as the



VIBRO-ENERGY finishing mill is shown in action as parts are cleaned in media moved in a rapid spiral motion at Southwestern Engineering Co. booth.

B-52 and B-58, the current operational ballistic missiles such as Thor and Atlas, that depend on specially designed and engineered metals for structural integrity.

Gen. Ritland described the growing dependence of the defense program on industrial resources that have the know-how to develop these metals and metal products. He concluded by saying that such activity is not one sided in favor of the military but that long range industrial and consumer benefits will accrue from military development programs.

Among things new at the show was a rapid induction heating system introduced by Tocco Div., Ohio Crankshaft, a gun which shoots 1/4-in. rivets through 1/2-in. mild steel shown by Superweld, a painting device for metal finishing by DeVilbiss Co. that sprays two colors in a visible fog at one time, a new Southwest Engineering Co. finishing mill that deburrs metals, ceramics and plastics, and even something for the smog weary, a new smog control device for autos using metal processes developed by Chromizing Corp.

Other new products included an aluminum flux made by Lake Chemical that permits soldering of aluminum with ordinary soft solders, samples of beryllium oxide from Beryllium Corp. that are joined by bonding agents stronger than parent metal, and for non-destructive testing, a new portable Flash X-ray unit by Field Emission Corp. weighing only 40 pounds that produces sharp internal photographs of metal products.

An innovation at the show this year was the Informa-Badge worn by all registrants. A combination identification tag and embossed plastic imprinting device, it was used by showgoers to have their name, firm or plant, and address placed on mailing lists for literature or additional information. The registrant simply handed over his badge to a booth attendant who operated an imprinting machine.



CHECKING CONTROLS of new model Pacific Scientific hydrogen brazing furnace is W. J. Parsons, senior vice president of the firm.



WORKING MODEL of high energy rate forming machine is explained to booth visitor by Richard McCormick, assistant to the president, Arcturus Manufacturing Co. Firm specializes in forgings from hard-to-work metals.



TOOLS IN ACTION were featured at Milwaukee Electric Tool exhibit. Walt Sivula and John Hiss demonstrate the Sawzall reciprocating power hack saw and Sawzitt jig saw. Sawzitt, at right, made its debut on the West Coast at the show.



LINDE REPRESENTATIVES on hand to greet booth visitors were G. P. Anderson and R. A. Harmon, distributor products, Los Angeles, and J. B. Hanna, San Francisco. Featured in display was new Linde 4-in-1 Sigmatic welder.

Glo-Quartz Establishes Pasadena Heater Plant



In a major expansion that doubles the size of West Coast facilities, Glo-Quartz Electric Heater Co., Inc., has moved into a 7000 sq. ft. plant devoted to manufacture of strip heaters, blast coil heaters, swaged heating elements and a full range of industrial models for electronic and missile industry application. In charge of the facility is George Strokes, Western manager.

Pueblo CF&I Reopens Third Blast Furnace

PUEBLO, COLO.—Relighting of a third blast furnace at the Pueblo plant of the Colorado Fuel & Iron Corp., which has been down since May 7, 1960, for complete rebuilding, will provide work for more than 200 men and will raise the total work force there to over the 7,000 mark.

An additional 80 men returned to work last month at the CF&I's Allen Mine at Weston, Colo., which supplies coal for the Pueblo plant's coke plant, it was reported.

Officials said the decision to relight the "A" furnace, the company's largest, was "prompted by the encouraging pattern of orders for CF&I steel products manufactured at the Pueblo plant and the resulting operation step-up throughout the mill."

U.S. Peroxygen Expands Richmond Facilities

RICHMOND, CALIF. — U.S. Peroxygen Corp., manufacturer of organic peroxides, has expanded its plant facilities in order to triple the output of BZQ-50 and BZQ-55, non-separating benzoyl peroxide paste formulations, according to David Buschman, president of the company.

Buschman said that increasing demand for the non-separating benzoyl peroxide pastes, particularly among boat builders, industrial molders, and auto body putty manufacturers, has necessitated the boost in capacity.

BZQ is primarily employed as a polymerization catalyst for monomeric vinyl, acrylic, styrene and polyester resins and copolymers of these resins wherever the presence of an ester type plasticizer is advantageous.

Bekins Van Acquires Honolulu Facilities

HONOLULU—Daniel P. Bryant, president of Bekins Van & Storage Co., has announced acquisition of the facilities of Trans Ocean Van Service, here, at 2839 Mokumoa St.

The acquisition gives Bekins a total of 33,000 sq. ft. of office and storage space, a focal point for the firm's Far-Eastern military and civilian overseas business.

Prior to establishing its own facilities here, Bekins has done business in Hawaii for many years in association with the Honolulu Drayage and Construction Co.

Dave Cohee of Bekins' Glendale, Calif., office, has been named new district manager in Honolulu. Bekins' headquarters are located in Los Angeles.

New Engineering Company Established in Torrance

TORRANCE, CALIF. — Fleming Industries, Inc., has been established to undertake design, development and manufacture of electronic ordnance components and equipment.

In introducing the new organization, Walter H. Fleming, president, said that the firm will work in the field of integrated electronic-explosive systems. The technical staff of Fleming Industries has been pioneering new concepts in the field of firing devices, electronic explosives and test equipment for use with explosives for more than five years and have found it desirable to group our scientific skills, Fleming said.

F. M. Cummings is vice-president operations and W. G. Blodgett is chief engineer.

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Oil Processing Plant Planned for Anchorage

ANCHORAGE — *Ralph G. Hand*, vice president of the Refiners Sales Co., Long Beach, Calif., announced here recently that he has three possible sites under study for building a crude oil processing facility which he plans to have in operation by Sept., 1961.

The firm, to be known as the Western Frontier Oil & Refining Co., will be a sole proprietorship operation with a daily refinery run capacity of about 2,000 barrels of oil. The refinery will be a "topping" unit producing gasoline, kerosene distillate, jet fuel, diesel fuel and "Bunker C" heavy fuel, Hand said.

The Refiners Sales Co. has operated a similar plant in Long Beach for the past 20 years, Hand said. The distillation process used produces no undesirable odors or atmospheric contamination, he said.

Stanley E. Morris Adds Material Handling Lines

LOS ANGELES—Stanley E. Morris Co., material handling firm, has recently been appointed exclusive Southern California distributor for the Randolph Parts Handling System and for Palletainers, the latter manufactured by Union Steel Products Co.

Palletainers, engineered steel mesh containers built to solve both in-plant product handling, storage and shipping, come in a variety of sizes and capacities ranging from 200 to 6,000 pounds. They are designed for fork lift and manual handling of any commodity retained by one-inch mesh.

The Randolph line of steel tote boxes, tote box racks and accessories is applicable for handling small parts in receiving, stock room, processing, parts transfer and storage.

Stanley E. Morris is located at 5584 Alhambra Ave., here.

Pipe Linings, Inc., to Build Near San Jose

LOS ANGELES—Pipe Linings, Inc., of Wilmington, Calif., is breaking ground and will erect a 23-acre facility at Milpitas, Calif., six miles north of San Jose.

The plant will apply corrosion protection linings and coatings to water, gas and oil pipe. Services will include Somatic coating, coal tar and asphalt wraps, and the company's new cement mortar coating.

\$2,000,000 Soy Bean Plant for Washington

SEATTLE — A \$2,000,000 soybean process and soy oil refining plant will be built at Quincy, Grant County, Washington, for Columbia Vegetable Oils, Inc., according to an announcement by *Lyle Kleinschmidt* and *Austin Fraser*, company officials, both of Seattle.

The company has reached an agreement with the Quincy Port District for the plant site. Officials said operations will begin early next year

although a storage building will be ready for this fall's crop.

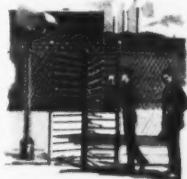
Kleinschmidt said Columbia Vegetable Oils is being established to handle a yearly potential soybean production of 30,000 acres in the Columbia Basin. The plant will have an initial capacity of about 100 tons of beans daily, on a three-shift, seven-day basis.

A study of the soybean market undertaken last year by the Washington State Dept. of Commerce and Economic Development led to the new plant, Kleinschmidt said.



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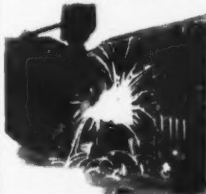
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Contract News of the West

The U. S. Army Ordnance District, Los Angeles, with headquarters at 55 S. Grand Ave., Pasadena, announced Feb. 24 the award of over \$2,000,000 in Army Ordnance contracts during the past four weeks to the following contractors:

Sperry Utah Engineering Laboratory, Salt Lake City, \$40,879 for Sergeant missile ground handling and test equipment; \$61,532 for Sergeant repair parts; and \$967,000 for continued Sergeant research and development.

Radioplane, Div. of Northrop Corp., Van Nuys, Calif., \$359,420 for flight services for target missiles.

Astronics Div., Lear, Inc., Santa Monica, Calif., \$313,953 for research and development of gyroscopes.

Douglas Aircraft Co., Inc., Santa Monica, \$258,695 for Nike missile system spare parts.

Nortronics, Div. of Northrop Corp., Anaheim, Calif. \$149,259 for Hawk missile system repair parts.

Electro-Optical Systems, Inc., Pasadena, Calif., a \$79,668 research and development contract for design and development of remote setting microbaroswitch.

Harvey Aluminum, Inc., Torrance, Calif., \$40,000 for piston assembly.

Advanced Technology Corp., Goleta, Calif., a \$33,783 research and development contract for study of a gun-boosted rocket system.

Gillfillan Brothers, Inc., Los Angeles, \$31,402 for Corporal missile system repair parts.

Other contracts reported to WESTERN INDUSTRY during March include:

George A. Fuller Co. and Del E. Webb Corp., Los Angeles, a \$61,733,644 contract for construction of a Minuteman Missile Operational Base in Montana was awarded by Corps of Engineers Ballistic Missile Construction Office.

Bendix-Pacific Div., Bendix Corp., North Hollywood, Calif., \$1,300,000 follow-on production order from Convair-Pomona Div. of electronic

portions of the Terrier missile guidance system.

Hoffman Electronics Corp., Military Products Div., Los Angeles, \$1,250,000 for additional submarine radio transmitters and \$986,000 for further work in connection with a current contract for research and development of a new high-powered transmitter for the Navy's newest nuclear-powered submarines.

Summers Gyroscope Co., Santa Monica, \$650,000 for free gyros destined for use in the Navy's advanced Terrier and Tartar guided missiles from Convair/Pomona, Convair Div. and \$200,000 from Beech Aircraft Corp., Wichita, Kans., for position-and-rate gyros and system components.

Stainless Steel Products, Inc., Burbank, Calif., contracts of over \$800,000 for design, development and manufacture of ducting systems and bellows and expansion joints. Contracts include work for McDonnell Aircraft on the Navy's F4H carrier fighter.

Marquardt Corp., Van Nuys, Calif., \$750,000 for continuing production of inlet control systems and spare parts for the McDonnell Aircraft Corp. F4H aircraft and \$59,945 from George C. Marshall Flight Center, National Aeronautics and Space Administration, for investigation of exhaust nozzle flow phenomena in arc-jet engines.

Eitel-McCullough, Inc., San Carlos, Calif., \$432,000 from Aero-space Div., Ryan Aeronautical Co., San Diego, for traveling-wave tubes for high-speed Q-2C Firebee target drone.

Siegler Corp.'s Hallamore Electronics Div., Los Angeles, \$350,000 from Convair Astronautics Div., General Dynamics Corp., for design and manufacture of a television instrumentation system for Centaur, a National Aeronautics and Space Administration program.

Burton Mfg. Co., Santa Monica, \$200,000 for ground support equipment from Republic Aviation Co.

Micromega Corp., Venice, Calif., \$130,000 for design and production

of S-Band parametric amplifiers from Gillfillan Brothers, Inc., Los Angeles.

Browns-Olds Plumbing & Heating Co., Albuquerque, N. M., \$62,000 for modifications to technical building 863 at Sandia Laboratory for Atomic Energy Commission.

Western Utility Co., Albuquerque, \$11,200 for improvements to the utility systems of the South Albuquerque Works which is operated for Atomic Energy Commission by ACF Industries, Inc.

Pacific Scientific Represents Mears Electric Controls, Inc.

LOS ANGELES — *Kenneth N. Robertson*, air conditioning divisional manager for Pacific Scientific Co., here, has announced that his company will represent Mears Electric Controls, Inc. exclusively in the eleven Western states.

Mears Electric Controls manufacture a complete line of voltage electric thermostats featuring two stage modulation, snap action switches, close sensitivity, and decorator styling.

Mears Research & Development at their new plant near Portland, Ore. is developing equipment for the air conditioning industry which will also be handled by Pacific Scientific through their six Western sales offices.

Classified Section

Space is sold as advertisers' inches. All advertisements in this section are 1/4 inch short of contracted space to allow for borders and composition. Rates are \$16.00 a column inch. Copy should be sent in by the 20th of preceding month if proofs are required; by the 25th if no proofs are required.

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WESTERN INDUSTRY/APRIL 1961

Goettl Bros. Metal Expands at Phoenix

PHOENIX—Goettl Bros. Metal Products, manufacturers of air conditioning equipment, has undergone an extensive expansion program, according to William H. Goettl, president.

The company purchased a 10-acre site served by a railroad spur at 54th St. and Jackson, Goettl said. The property includes 6,000 sq. ft. of warehouse, storage and manufacturing space.

Part of the newly acquired space is occupied by tenants who will remain for the present, Goettl said. For the time being Goettl will use its area there for receiving carload shipments of supplies and as a warehouse.

Future plans for this property will result in an eventual investment of \$750,000, Goettl said.

Independent Research Laboratories Organize

LOS ANGELES — Western Independent Research Laboratories, Inc. has been incorporated for \$500,000 by a group of California independent laboratories to engage in technical research.

Headquarters are at 4101 N. Figueroa St., Los Angeles, with other offices in San Diego, San Francisco and Sacramento.

Officers are: president, Philip W. Helsley of Testing Engineers, Inc., San Diego; vice presidents: Dr. Philip J. Charley of Truesdail Laboratories, Inc. and Richard P. Beedle of Geo. W. Gooch Laboratories, Ltd., both of Los Angeles; secretary: William M. Mullenex of Abbot A. Hanks, Inc., San Francisco; treasurer. Frank W. Barley, Jr., of American Spectrographic Laboratories, San Francisco.

Bennett Company Appointed Oregon Tubar Distributor

PORTLAND — F. E. Bennett Co., 426 N.W. Sixth Ave., here, has been appointed exclusive distributors of Tubar materials handling equipment by the manufacturer, Uhrden, Inc., of Dennison, Ohio.

The distributorship will cover the state of Oregon and the southern counties of Washington, including Walla Walla, Wahkiakum, Cowlitz, Skamania, Clark and Klickitat.

Uhrden, Inc., manufactures custom-engineered unloaders, dumpers, work positioners, lifts and cranes under the Tubar trade name.

Plans Underway on GM's Fremont Assembly Plants

SAN FRANCISCO — The firm of John S. Bolles, architects and engineers, has been retained as consultants for the new \$30,000,000 automobile assembly plants of both the Chevrolet and Fisher Body Divisions of the General Motors Corp. at Fremont, Calif.

The vast industrial facility will occupy a site of 300 acres and will contain approximately 2 million square feet of space in a single-story, incom-

bustible, open steel-frame buildings with partial second floors.

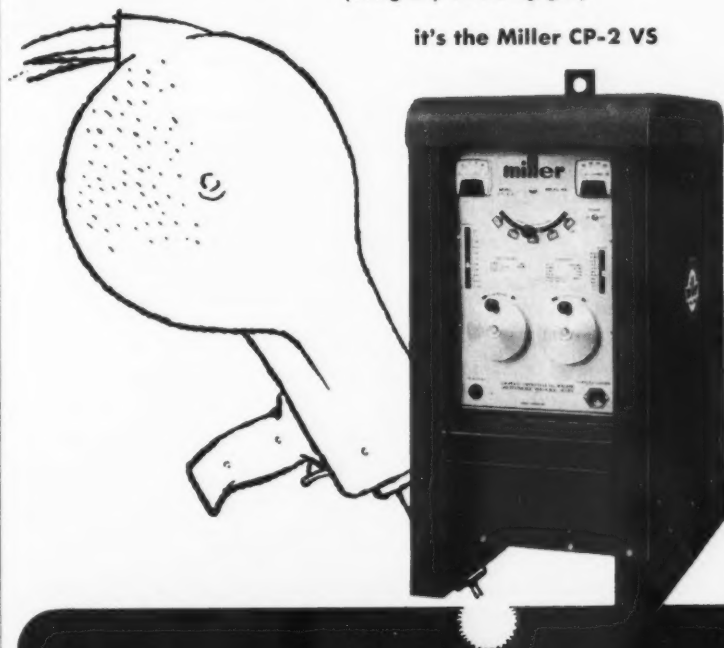
Structural systems, developed in a modular bay-size of 48 ft. by 48 ft., for the production areas, will be enclosed by an exterior skin of lightweight siding. The roof spans will be accomplished by the use of a two-way truss system and the roof deck will consist of metal and concrete component construction.

Completion of the construction program has been scheduled in order to permit the assembly of the 1963 automobile models.

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Swift and solid success of Miller's variable slope d-c constant potential 300 ampere welder and the 500 ampere CP-5 led to the development of the above 200 ampere version. Offered especially for use with recently introduced 200 ampere air-cooled guns having self-contained spools of wire, the CP-2 VS delivers:

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Information available upon request relating to 200 ampere CP-2 VS, 300 ampere CP-3 VS or 500 ampere horizontal model, the CP-5.

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T. R. Maher
Packard-Bell



Dr. George Krsek
International Rectifier



J. P. Holden
United Control

■ **Edwin W. Pauley, Jr.**, Los Angeles independent oil operator, has been elected a director of Dyna-Therm Chemical Corp., Culver City.

■ **Glenn R. Hunter** is newly appointed Pacific Northwest region manager, Square D Co., in charge of Seattle assembly plant.

■ **Merton A. Travis** has been named manager, Multi-Rack Systems Div., Green-Penny Co., Los Angeles.

■ **James B. Black**, board chairman, Pacific Gas & Electric Co., San Francisco, has been elected a director, Food Machinery & Chemical Corp., San Jose, Calif.

■ **James T. Shore** has been named program manager, Industrial Gas Turbines, Garrett Corp.'s AiResearch Mfg. Div., Phoenix.

■ **Thomas R. Maher** has been named director, manufacturing, Packard Bell's Technical Products Div., Los Angeles.

■ **Dr. George Krsek** has joined International Rectifier Corp., El Segundo, Calif., as executive vice president and general manager.

■ **John P. Holden** has been appointed manufacturing manager, United Control Corp., Seattle.

■ **William G. Wolff** has been named applications manager, Temptron, Inc., Reseda, Calif.

■ **Robert C. Sherburne** is newly appointed vice president and secretary-treasurer, Royal Industries, Inc., Los Angeles.

■ **John A. Somers** has been named executive vice president, Bach Auricon, Inc., Los Angeles.

■ **Bob McGaughey** has been appointed manager, Computer Measurements Co.'s systems engineering department, Sylmar, Calif.

■ **William Brown** is new chief engineer, J. C. Carter Co., Costa Mesa, Calif.

■ **Bertram Mintz** has been named director systems support, Acoustica Div., Acoustica Associates, Inc., Los Angeles.

■ **Edwin F. Beacham** has been named vice president, operations, Connector Div., Viking Industries, Inc., Canoga Park, Calif.

■ **Theodore B. Mathisen**, Portland, is newly named Northwest sales representative, Sierra Drawn Steel Div., Bliss & Laughlin, Inc.

■ **Jim Kirwan** is in charge of Matthews Corp.'s new technical liaison office in Seattle.

■ **Tudor R. Finch** is newly named assistant general manager, Motorola's Semiconductor Products Div., Phoenix.

■ **R. A. Powley** has been named manager manufacturing staff, Aeronutronic Div., Ford Motor Co., Newport Beach, Calif.

■ **William F. Horn** has been appointed West Coast regional manager, Sperry Gyroscope Co.'s field operations, headquartering at El Segundo, Calif.

■ **Robert R. Beachler, Jr.**, has been elected vice president, Leach Corp., and general manager Leach Relay Div., Los Angeles.

■ **Dr. Louis B. Werner** has joined Hazleton-Nuclear Science Corp., Palo Alto, Calif., as vice president.

■ **Robert A. Hall** has been named director connector operations, Data Recorders Div., Consolidated Electrodynamics Corp., Pasadena, Calif.

■ **Hugo Riemer** has been elected president, United States Borax & Chemical Corp., Los Angeles. Former president **James M. Gerstley** has been named vice chairman of the board.

■ **Robert A. Lineberger** has been appointed assistant controller, Beckman Instruments, Inc., Fullerton, Calif.

- *D. V. Phelon* has joined Dole Corp.'s pineapple processing plant, Honolulu, as plant manager.
- *Raymond E. Jones* has been promoted to vice president sales, Matthews Corp., Hawthorne, Calif.
- *Park Pontius*, sales manufacturer with Burg Tool Mfg. Co., Burbank, Calif., has retired.
- *Gerard Alexander* has been appointed director of market planning, B. F. Goodrich Co., Los Angeles.
- *Dr. Choh-Yi Ang* has been appointed manager, Telecomputing Corp.'s Physics Research Laboratory, San Diego.
- *Stewart D. Barradle* has joined Weyerhaeuser Co. as manager light construction research department, Seattle.
- *Robert Rankin* and *William Duncan* have been named Northern California district sales supervisors, Soule Steel Co., San Francisco.
- *Austin F. Leach* has been appointed manager, product planning and market research, Omark Industries, Inc., Portland.
- *Allen T. Beall* is newly appointed vice president, finance, Dashew Business Machines, Inc., Los Angeles.
- *William M. Allen*, Seattle, has been elected to the board of directors, Standard Oil Co. of Calif., San Francisco.
- *Dr. S. C. Cheo* has been named senior project engineer, new product development, Vega Electronics Corp., Cupertino, Calif.
- *Stuart H. Cole* has been named Western district manager, Los Angeles, for Barden Corp.
- *Richard G. Genton* has joined Wheelabrator Corp., as regional dust and fume engineer, operating from Los Angeles and San Francisco offices.
- *C. E. Burton* has been named executive vice president of Atlas Copco Pacific, San Carlos, Calif.
- *Dr. Paul J. Flory*, physical chemist, has joined the faculty of Stanford University, Palo Alto, Calif.
- *George Beetlestone* has been promoted to plant superintendent, Fluorocarbon Co., Anaheim, Calif.
- *J. M. Bettis*, Irrigators Lumber Co., Caldwell, Ida., has been elected president, Western Retail Lumbermen's Association, Seattle.
- *Earl H. Houston*, Longview, Wash., and formerly associated with Long-Bell Div., International Paper Co., passed away recently.
- *Robert Hautzik* has joined the Microwave Laboratories, Quantatron, Inc., Santa Monica, Calif., as manager microwave engineering.
- *Thomas F. Boyle*, Works Engineer, Bethlehem Steel Co.'s Alameda, Calif., Fabricating Works, has retired after 38 years with the company.
- *Capt. Frank W. Taylor*, USN (Ret.) has joined Photo-Optical Div., Consolidated Systems Corp., Pasadena, Calif., as products manager.
- *Donald L. Driscoll* has been elected vice president, marketing, American Avionics, Inc., Los Angeles.
- *Donald M. Hoff* is newly appointed sales representative in the Northwest for Stanley Tools, Div. Stanley Works.
- *Camille M. Shaar, Jr.* has been named head of Aerospace Operations, Defense Systems Div., General Motors, Santa Barbara, Calif.
- *William K. OpDyke* has been appointed research manager, Los Angeles Chamber of Commerce.
- *Paul H. Reedy*, president, Interstate Electronics Corp., Anaheim, Calif., recently received Navy's Distinguished Public Service Award.
- *Robert V. Gunther* has been appointed executive vice president and general manager, Southwestern Engineering Co., Los Angeles.
- *Eugene F. Petersen* has joined Rapistan of California, Inc., as sales engineer, San Jose, Calif.
- *Robert W. Pickrell* is newly appointed secretary-manager, Alaska Loggers Association.
- *Louis Martin* has joined Eitel-McCullough, Inc., San Carlos, Calif., as manager, marketing operations.
- *Edward H. DaCosta*, formerly general manager of Taylor Fibre Co.'s La Verne, Calif. plant, has been elected president of the company at Norristown, Pa.
- *Ralph G. Lindstrom* has been named manager, engineering services department, Western Development Laboratories, Philco Corp., Palo Alto, Calif.
- *Anthony J. Toth* has been appointed general foreman, Colorado Fuel & Iron Corp.'s Pueblo, Colo. plant 25-inch mill.
- *Charles T. Fettel* has been appointed superintendent Blooming, Slabbing, Structural Mills and Soaking Pits, Kaiser Steel Corp., Fontana, Calif.
- *Garth Stonehocker*, physicist at National Bureau of Standards, Boulder, Colo., has been honored for scientific contributions in Antarctica. Stonehocker Point in the Antarctic has been named in his honor.
- *Sam Harman* has been named sales representative, Howell Co., a division of Acme Steel Co., for Alaska.
- *Roger B. Ulvestad* has been named special assistant to the president, Flying Tiger Line, Burbank, Calif.
- *William B. Snow* has joined the scientific staff of Bissett-Berman Corp., Los Angeles.
- *Leonard J. Malin* is newly appointed plant manager for Chem Seal Corp. of America, Los Angeles.
- *Harold R. Wiltermood* has been named president, Holt Mfg. Co., Oakland, Calif.
- *Howard Janin* has been elected president, W. R. Ames Co., Milpitas, Calif.
- *Robert E. Greenwood* has been named sales manager, Ungar Electric Tools, Hawthorne, Calif.
- *P. J. Stefik, Jr.* has been appointed sales manager, Portland area, Union Carbide Metals Co.
- *Robert Curiel* has been named assistant manager, ComputerMat, Inc., Los Angeles.
- *Larry Decker* has been named vice president, traffic and sales, Bonanza Air Lines, Las Vegas, Nev.
- *Stanwood A. Murphy* has been elected president, Pacific Lumber Co., San Francisco.
- *Joseph H. Famme* has been named assistant division manager, operations, for Convair, San Diego.

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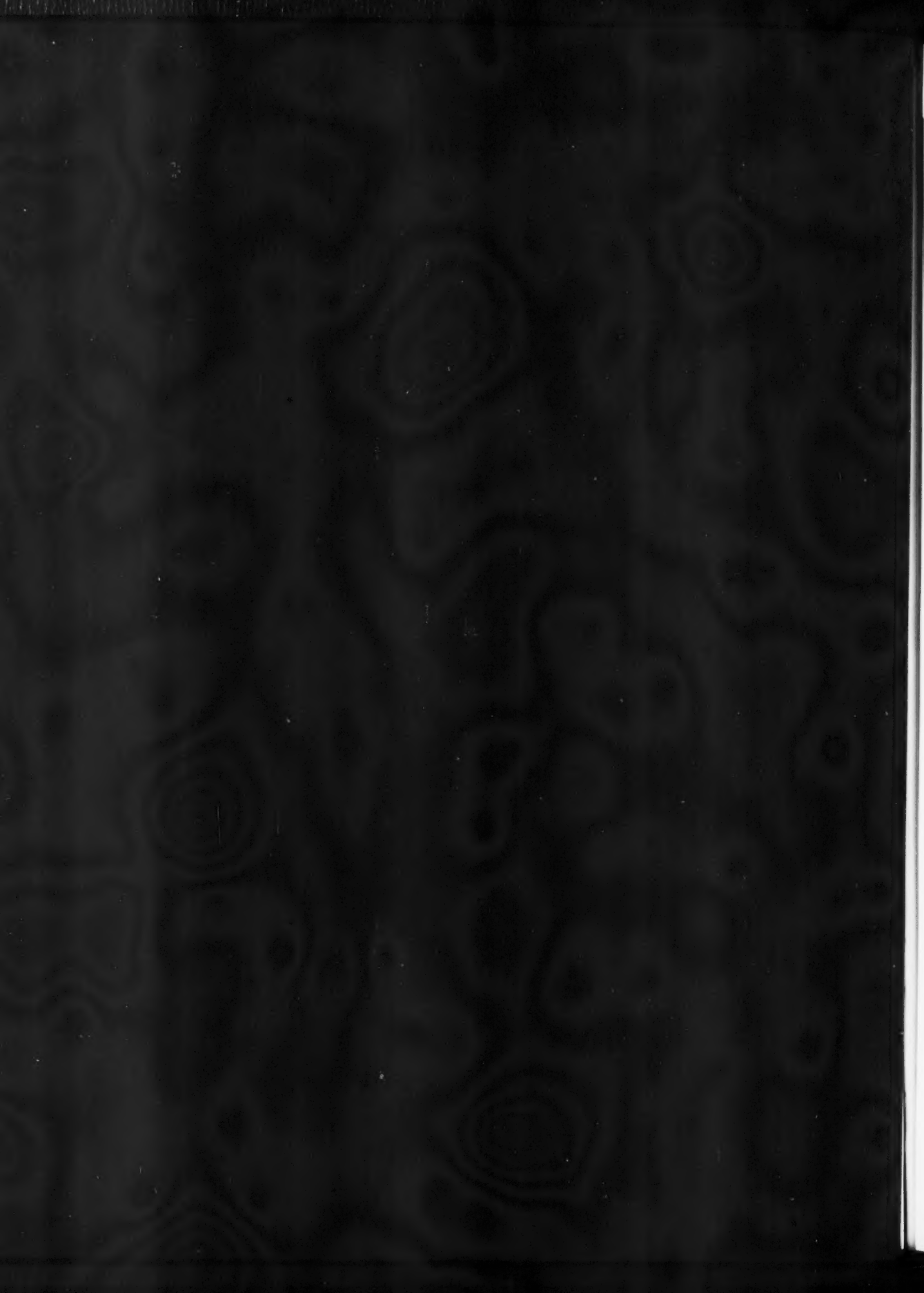
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